# LFD-Monitor

Chassis : LH46CKP
LH46CKT

Model : 460UT-2
460UTn-2

# SERVICE Manual

## LFD Monitor

460UT-2 / 460UTn-2

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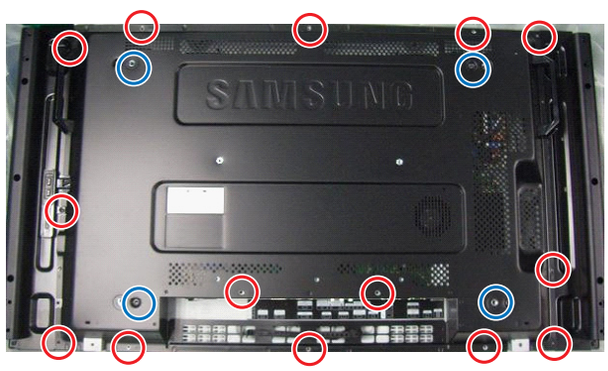
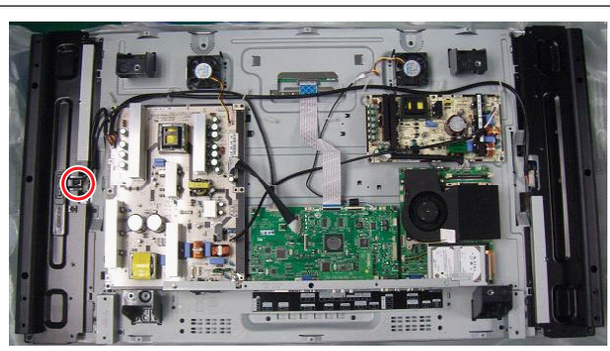
# 3. Disassembly and Reassemble

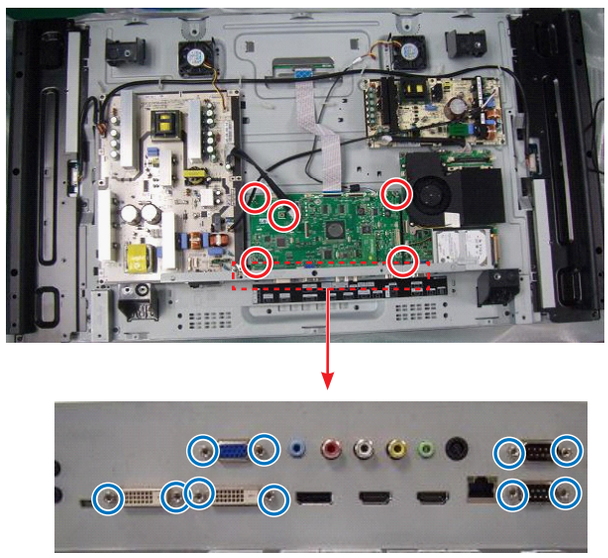
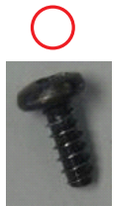
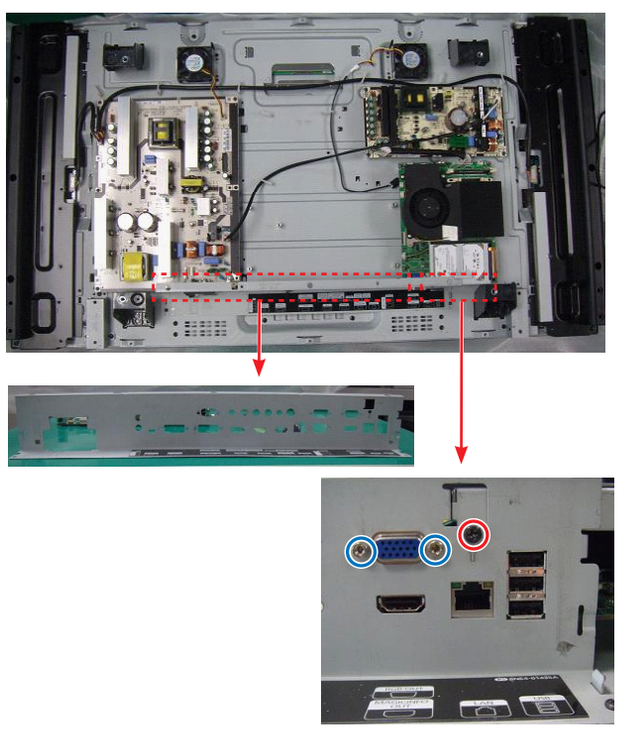
This section of the service manual describes the disassembly and reassembly procedures for the monitor.

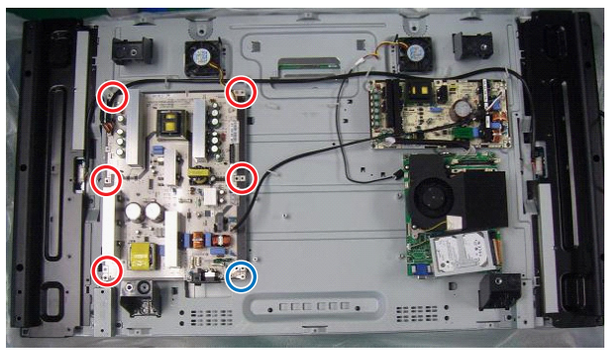
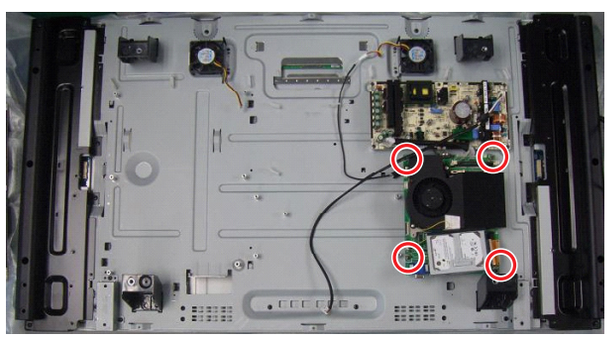
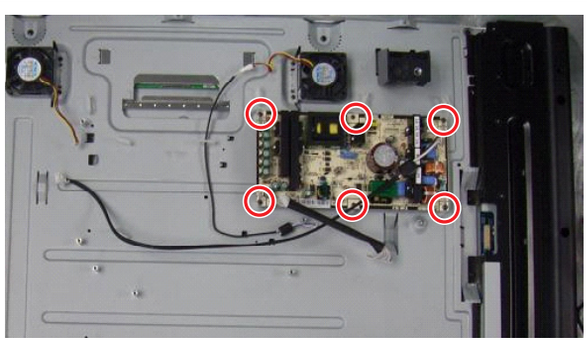
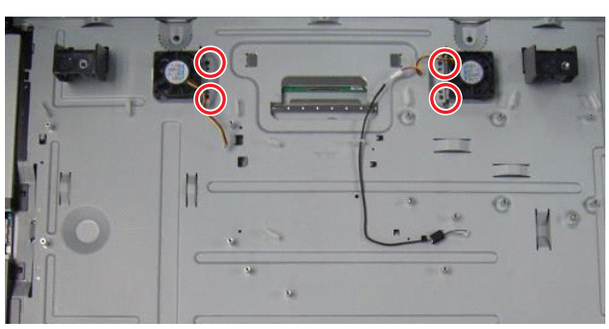
⚠ **WARNING:** This monitor contains electrostatically sensitive devices. Use caution when handling these components.

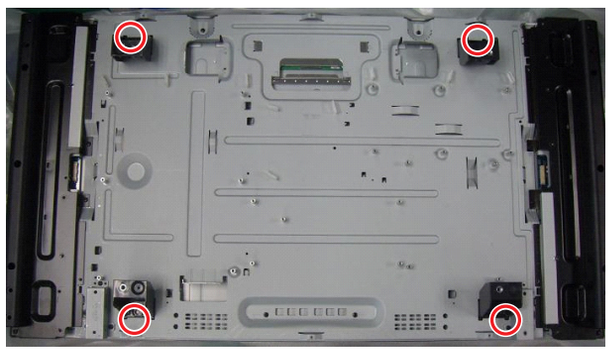
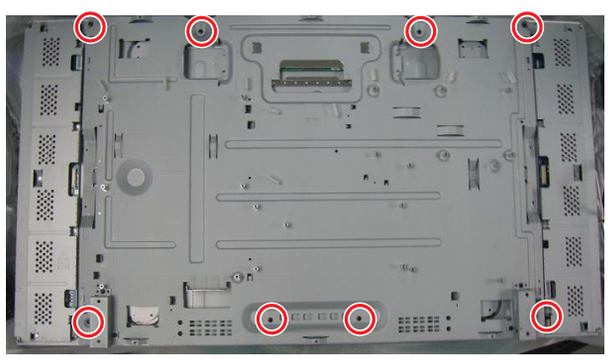
## 3-1. Disassembly

⚠ **Cautions:**
1. Turn the monitor off before beginning the disassembly process.
2. When disassembling the monitor, do not use any metal tools except for the provided jig.
3. Remove the signal cable and the power cord before beginning the disassembly.

| Description | Picture Description | Screws |
|---|---|---|
| 1. Remocve the 18ea screws and lift up cover Rear. |  | Screw (M4 x L8) S type Screw (M4 x L12) B type |
| 2. Remove the one screw of assy function and separate the cable connected to main PBA. |  | Screw (M4 x L8) S type |

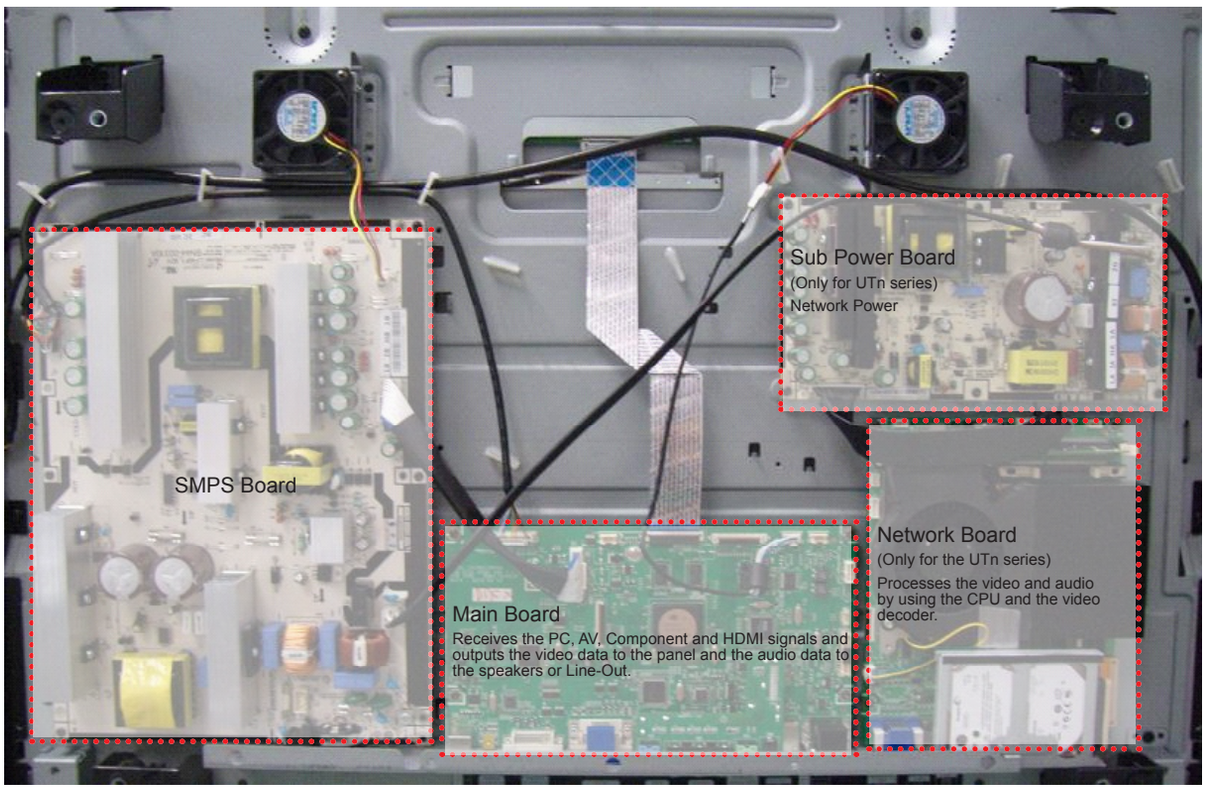
| Description | Picture Description | Screws |
|---|---|---|
| 3. Remove the screws (5ea) and angle screws(10ea), separate the main PBA after sererating connector. |  |  Screw (M3 x L8) S Type |
| 4. After removing the screws (3ea) and angle screws(2ea), seperate SHIELE JACK. |  | Screw (M3 x L8) S Type |

| Description | Picture Description | Screws |
|---|---|---|
| 5. After removing the screws(6ea) and connected cable, seperate MAIN SMPS. |  | Screw (M3 x L8) S Type Screw (M4 x L8) For safety |
| 6. After removing screws(4ea) and connected cable, seperate Network Board. (Only 460UTn-2 Model) |  | Screw (M3 x L8) S Type |
| 7. After removing the screw(6ea) and connected, separate Sub SMPS. (Only 460UTn-2 Model) |  | Screw (M3 x L8) S Type |
| 8. After removing the screws (2ea) and connected cable, seperate Assy Fan. |  | Screw (M3 x L8) S Type |

| Description | Picture Description | Screws |
|---|---|---|
| 9. Removing screws(4ea) and separate Holder Wall. |  | Screw (M5 x L12) S type |
| 10. Remove the screws (8ea) and separate Assy P Side. | | Screw (M4 x L8) S type |
| 11. Remove the screws (8ea) and seperate Bracket PCB/ PANEL. |  | Screw (M4 x L8) S type |

※Reassembly procedures are in the reverse order of disassembly procedures.

# 3-2. Internal Structure


Sub Power Board
(Only for UTn series)
Network Power
SMPS Board
Network Board
(Only for the UTn series)
Processes the video and audio by using the CPU and the video decoder.
Main Board
Receives the PC, AV, Component and HDMI signals and outputs the video data to the panel and the audio data to the speakers or Line-Out.

# Memo

# 1. Precautions

## 1-1. Safety Precautions

Follow these safety, servicing and ESD precautions to prevent damage and to protect against potential hazards such as electrical shock.

### 1-1-1. Warnings

1. For continued safety, do not attempt to modify the circuit board.
2. Disconnect the AC power and DC power jack before servicing.

### 1-1-2. Servicing the LCD Monitor

1. When servicing the LCD Monitor, Disconnect the AC line cord from the AC outlet.
2. It is essential that service technicians have an accurate voltage meter available at all times. Check the calibration of this meter periodically.

### 1-1-3. Fire and Shock Hazard

Before returning the monitor to the user, perform the following safety checks:

1. Inspect each lead dress to make certain that the leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the monitor.
2. Inspect all protective devices such as nonmetallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistorcapacitor networks, mechanical insulators, etc.
3. Leakage Current Hot Check (Figure 1-1):
   **WARNING** : Do not use an isolation transformer during this test.

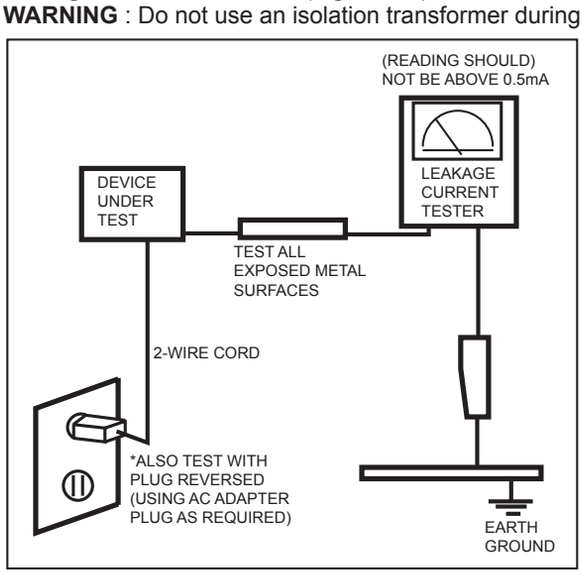



Figure 1-1. Leakage Current Test Circuit

4. With the unit completely reassembled, plug the AC line cord directly into a 110/220V AC outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: metal cabinets, screwheads and control shafts.
   The current measured should not exceed 0.5 milliamp.
   Reverse the power-plug prongs in the AC outlet and repeat the test.

### 1-1-4. Product Safety Notices

Some electrical and mechanical parts have special safetyrelated characteristics which are often not evident from visual inspection. The protection they give may not be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by ⚠ on schematics and parts lists. A substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

# 1-2. Servicing Precautions

**WARNING:** An electrolytic capacitor installed with the wrong polarity might explode.
**Caution:** Before servicing units covered by this service manual, read and follow the Safety Precautions section of this manual.
**Note:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions.

## 1-2-1 General Servicing Precautions

1. Always unplug the unit's AC power cord from the AC power source and disconnect the DC Power Jack before attempting to:
   (a) remove or reinstall any component or assembly, (b) disconnect PCB plugs or connectors, (c) connect a test component in parallel with an electrolytic capacitor.
2. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.
3. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the area around the serviced part has not been damaged.
4. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).
5. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500 V) to theblades of the AC plug.
   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.
6. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

# 1-3. Static Electricity Precautions

Some semiconductor (solid state) devices can be easily damaged by static electricity. Such components are commonly called Electrostatically Sensitive Devices (ESD). Examples of typical ESD are integrated circuits and some field-effect transistors. The following techniques will reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. To avoid a shock hazard, be sure to remove the wrist strap before applying power to the monitor.
2. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of an electrostatic charge.
3. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESDs.
4. Use only a grounded-tip soldering iron to solder or desolder ESDs.
5. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ESDs.
6. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.
7. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   **Caution:** Be sure no power is applied to the chassis or circuit and observe all other safety precautions.
8. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting your foot from a carpeted floor can generate enough static electricity to damage an ESD.

# 1-4. Installation Precautions

1. For safety reasons, more than two people are required for carrying the product.
2. Keeps the power cord away from any heat emitting devices, as a melted covering may cause fire or electric shock.
3. Do not place the product in areas with poor ventilation such as a bookshelf or closet. The increased internal temperature may cause fire.
4. Bend the external antenna cable when connecting it to the product. This is a measure to protect it from being exposed to moisture. Otherwise, it may cause a fire or electric shock.
5. Make sure to turn the power off and unplug the power cord from the outlet before repositioning the product. Also check the antenna cable or the external connectors if they are fully unplugged. Damage to the cord may cause fire or electric shock.
6. Keep the antenna far away from any high-voltage cables and install it firmly. Contact with the highvoltage cable or the antenna falling over may cause fire or electric shock.
7. When installing the product, leave enough space (10cm) between the product and the wall for ventilation purposes. A rise in temperature within the product may cause fire.

# Memo

# 2. Product specifications

## 2-1. Feature & Specifications

| Model | 460UT-2 / 460UTn-2 |
|---|---|
| **Feature** | |
| ▶ Space(7.3mm) between two neighboring displays<br>▶ Remote control(MDC) using RJ45 / RS-232SC<br>▶ Brightness adjustment using Ambient Sensor<br>▶ IR LOOP-OUT function<br>▶ Digital Loop out(HDMI, DVI, SBB TV, Network)_50 Set<br>▶ DDC-CI (D-sub/DVI), Remote Update<br>▶ Connectivity : D-SUB, DVI, HDMI1/2, DP,AV, RS232C IN/OUT, RJ45, PC Audio(Stereo) In/Out<br>TV/DTV , Network function<br>▶ Programmable PIP (Picture In Picture) : Only Magic info Source<br>▶ Active Size/Position adjustment, Picture mode for Public Display, Gamma adjustment, Schedule for weekends and holidays<br>▶ SW Upgrade by Digital Signal, Addition of Pixel to safety screen<br>▶ FAN/Temperature, Auto Power, Function Key Disable, User Auto Color, DPM Control, Lamp Schedule, OSD Display<br>▶ Service Menu : Always Auto Adjustment, Addition of PC Timing<br>▶ Network<br>- CPU : AthlonX II 2.7GHz (Dual Core)<br>- North Bridge : AMD RS780<br>- South Bridge : AMD SB700<br>- Memory : DDR3 SO-DIMM<br>- HDD : SATA 40GB<br>- OS : Windows XP Embedded<br>- Connectors : 3 x USB2.0 port, LAN port, RGB out port, HDMI out port | |

| Specifications | | |
|---|---|---|
| **Item** | | **Description** |
| **Panel** | | AMLCD 46” (LTI460AA04) |
| **Optimum Resolution** | | 1366 X 768 |
| **Display Size** | | 16:9 |
| **Brightness** | | 700cd/m2 |
| **Contrast Ratio** | | 3000 : 1 (Typ) |
| **Response Time** | | Typical : 6ms / Max : 10ms |
| **View angle (H/V)** | | left/right/up/down : 89 °/89 °/89 °/89 ° |
| **PC Input** | | RGB, DVI |
| **Video input** | | DVI, HDMI, DP, COMPOSITE, Component |
| **About TV** | **TV** | NTSC 358, PAL/SECAM, PAL60, NTSC4.43, NTSC358, PAL M, PAL N |
| | **PIP/PBP support** | PIP support |
| **Resolution** | **PC/DVI** | Optimum : 1366 x 768 @ 60 Hz<br>Maimum : 1920 x1080 @ 60Hz |
| | **Component** | Optimum : 1366 x 768 @ 60 Hz<br>Maimum : 1920 x1080 @ 60Hz |
| | **HDMI** | Optimum : 1366 x 768 @ 60 Hz<br>Maimum : 1920 x1080 @ 60Hz |
| **Power consumtion** | **Voltage** | AC 100 to 240(50Hz/60Hz) |
| | **Max power consumption** | 360W (Network Model)<br>290W (None Network Model) |
| | **DPMS** | ≤ 5W |
| **Frequency sync** | **Horizontal Frequency** | 30 ~ 81 kHz |
| | **Vertical Frequency** | 56 ~ 85 Hz |
| | **Clock Frequency** | 148.5 MHz |
| | **Sync type** | Sep/ Comp/SOG |
| **Dimensions Set (W x D x H)** | | 1025.7 X 579.8 X 130.0 mm |
| **Weight** | | Set : 26.3 kg (None Network Model)<br>27.8 kg (Network Model)<br>Package : 31.7 kg (None Network Model)<br>33.2 kg (Network Model) |
| **Additional Specification** | **HDMI version** | 1.4a |
| | **TCO standard** | None |
| | **USB support** | USB 2.0 |
| | **Supporting color** | 8bit, 16.7M |

| Specifications | | |
|---|---|---|
| **Item** | | **Description** |
| **OS** | **OS** | Windows XP Embedded |
| | **HDD** | 40 G |
| | **CPU** | AMD Athlon II 2.7GHz (Dual Cord ) |
| | **Memory** | DDR3 SO-DIMM 2GB |
| **Special specification** | | Loop-out function (Network/DVI/HDMI)<br>Remote control using RJ45 / RS-232C<br>Network functon using Magic Info<br>Brightness and IR detection using Ambient Sensor |
| **Environmental Considerations** | **Network Model** | Operating Temperature : 10˚C ~ 40˚C (50˚F ~ 104˚F)<br>Operating Humidity : 10% ~ 80%<br>Operating Temperature : -20˚C ~ 45˚C (-4˚F ~ 113˚F)<br>Operating Humidity : 5% ~ 95% |
| | **None Network Model** | Operating Temperature : 0˚C ~ 40˚C (32 ˚F ~ 104˚F)<br>Operating Humidity : 10% ~ 80%<br>Operating Temperature : -20˚C ~ 45˚C (-4˚F ~ 113˚F)<br>Operating Humidity : 5% ~ 95% |

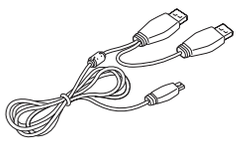
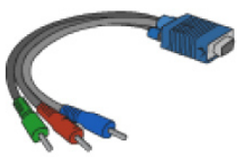
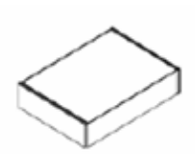
## 2-2. Spec Comparison to the Old Models

| Model | | Chingizkhan (460UTn-2 / 460UT-2 ) | Monterosa2 (460UTn / 460UT) |
|---|---|---|---|
| Design | | | |
| Panel | Size | 46” (1366x768) -> SPVA | 46” (1366x768) -> SPVA |
| | Spec | 700cd/m2, 3000:1, 8ms | 700cd/m2, 3000:1, 8ms |
| Input | PC | **D-Sub, DVI-D, DP** | D-Sub, DVI-D |
| | Video | **Component, AV, HDMI1, HDMI2** | Component, AV, HDMI |
| | TV | **Removable DTV SBB** | - |
| Output | | **Digital Loopout** | - |
| Feature | | **RJ45/RS232C MDC Program, OSD Pivot, Remote Control, Video Wall, Digital Loopout External Sensor Kit** | RS232C MDC Program, OSD Pivot, Remote Control, Video Wall |

## 2-3. Accessories

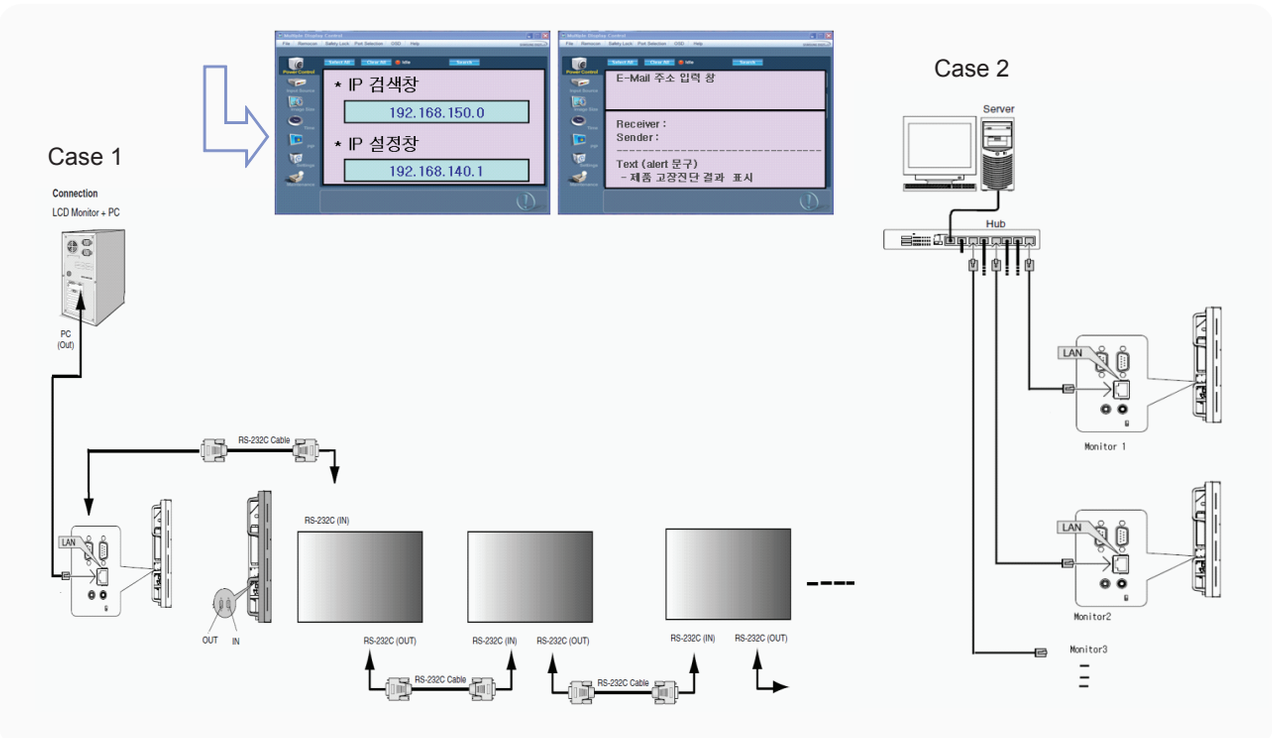
| Product | Description | Code. No | Remark |
|---|---|---|---|
| | Quick Setup Guide | BN68-02981A | Samsung Electronics Service center |
| | Warranty Card (Not available in all locations) | BN68-01789A | |
| | User's Manual | BN59-01094A | |
| | Remote Control | BP59-00138B | |
| | Power Cord | 3903-000455 | |
| | D-Sub Cable | BN39-00244H | |
| | MagicInfo Software CD, MagicInfo Manual CD (Applicable to the UTn Model only) | BN59-00821J BN59-00821K | |
| | Batteries (AAA × 2) | 4301-000121 | |

## 2-4. Accessories (Sold separately)

| Product | Description | Code. No | Remark |
|---|---|---|---|
| | RGB to BNC Cable | | Samsung Electronics Service center |
| | LAN Cable (Applicable to the UTn Model only) | BH39-00211A | |
|  | USB Cable (Applicable to the UTn Model only) | | |
|  | RGB-Component Cable RGB - AV Cable | | |
| | DVI to HDMI Cable | AK68-01439G | |
|  | Wall Mount KIT | Wire type : WMN1000BD<br>Frame type : WMN4270SD | |
| | Network Box (Applicable to the UT Model only) | | |
| | Semi Stand KIT | BN96-15394A | |

# 2-5. Product Differentiation Features

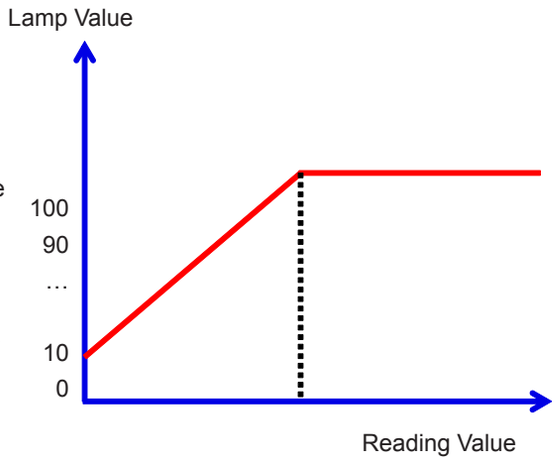
## ■ Remote control through built-in RJ45 and RS-232C ports (up to 100 units.)




1. The basic IP address of the monitor is set to the default in the factory.
2. Connect the monitor and PC with a LAN cable, connect to the monitor, and reconfigure the individual IP address.
3. The MDC program shows the list of IP addresses of the currently connected products and the list of IDs set in the OSD.
4. Using the MDC program, you can control each individual monitor.

## ■ Illumination Sensor

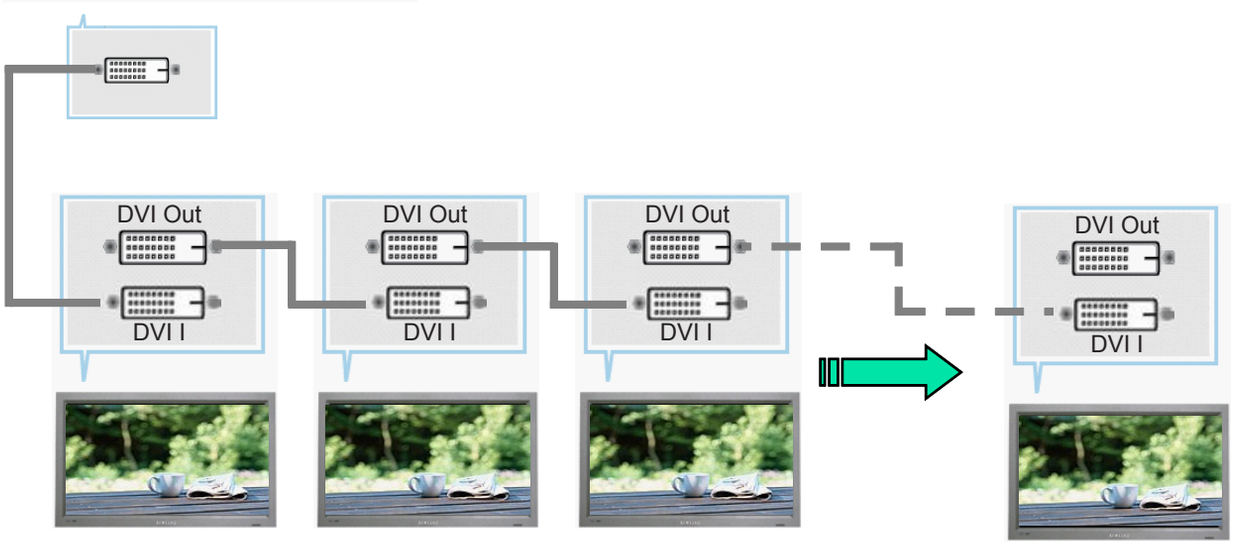
▷ The illumination sensor consists of a Photodiode and an A/D converter. The photodiode detects the surrounding illumination and the degree of illumination is converted into a digital value through the A/D (Analog to Digital) converter.
Depending on this value (Reading Value), the brightness of the lamp on the panel (Lamp Value) is changed automatically. The Lamp Value is set in 10 levels. If the Reading Value exceeds the limit, the lamp brightness remains the maximum 100.




▷ Improves the sensitivity of the existing illumination sensor according to the user conditions. The function has been improved so that the lamp brightness is maintained constant for a specific period of time, or the brightness is changed after a specified delay. In addition, the brightness is changed smoothly and not in steps to resolve the problem when the screen brightness is changed rapidly.

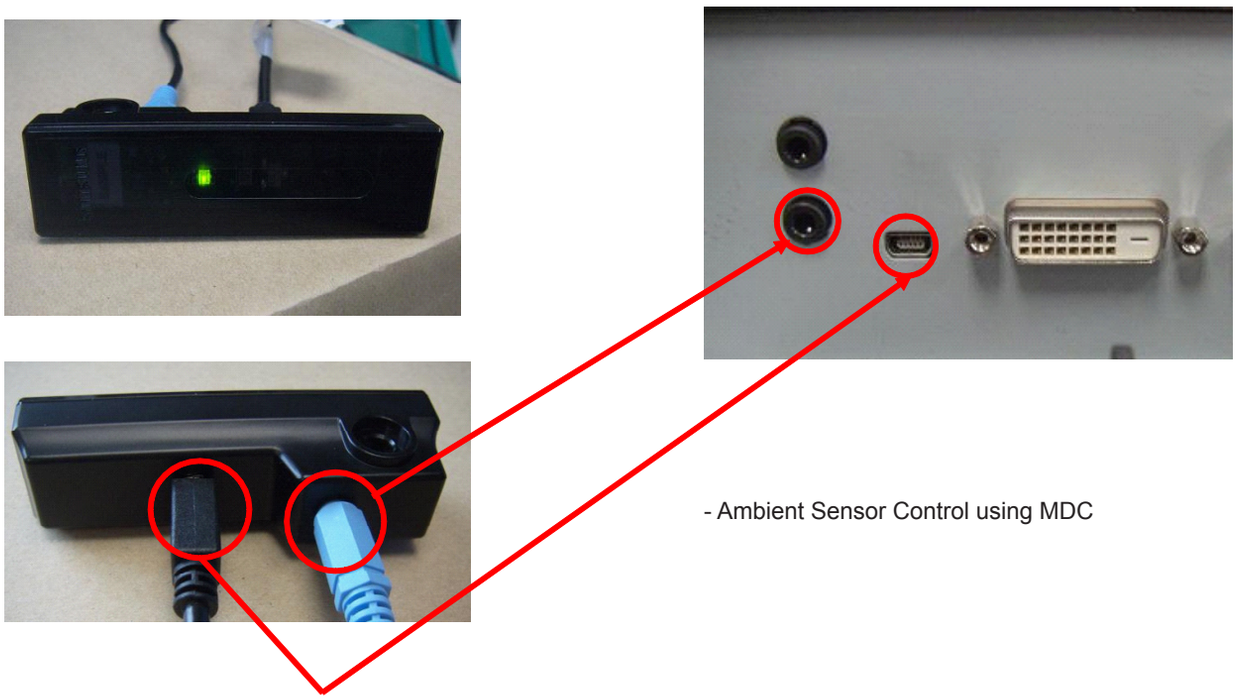
## ■ Digital loop-out function: You can connect up to 50 monitors in a Daisy chain.

- DVI/HDMI/DP/Magicinfo Source Supported



## ■ Brithness control using Ambient Sensor

▷This Model needs to use remote controller and automatically adjust brightness at the front of product.



- Ambient Sensor Control using MDC

## ■ Application of MagicInfo i Advanced

1. Existing Model

▷ MagicInfo: MagicInfo Pro / MagicInfo i Standard Edition

2. 460UTn-2

: Removing MagicInfo i Standard Version for MagicInfo i Advanced is a charged service.

▷ MagicInfo Pro / MagicInfo i Advanced is installed when the product is shipped.

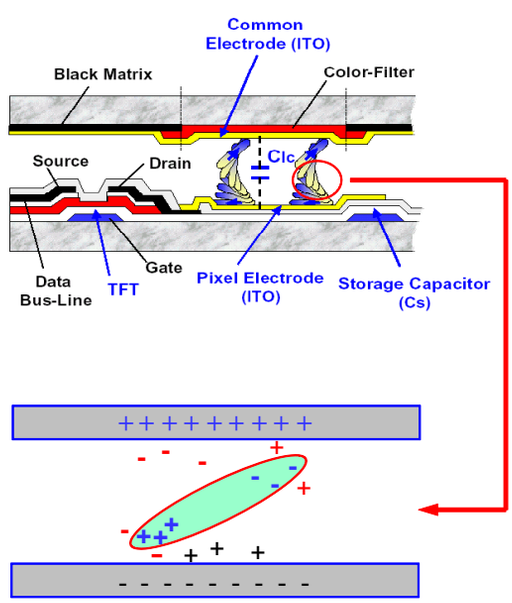
## ■ Protection of Image Retention

Image retention may not occur when a LCD panel is operated under normal conditions.

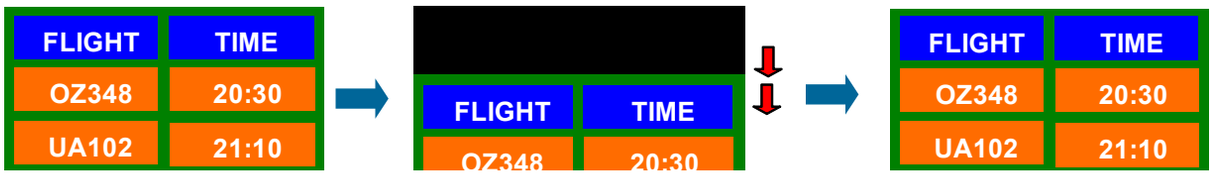
Normal conditions are defined as continuously changing video patterns. When the LCD panel is operated for a long time with a fixed pattern (over 12 hours), there may be slight difference in voltage between electrodes that work the liquid crystal (LC) in a pixel. The voltage difference between electrodes increases with time, forcing the liquid crystal to lean. When this occurs,

the previous image may be seen when the pattern is changed. To prevent this, the

accumulated voltage difference must be decreased.

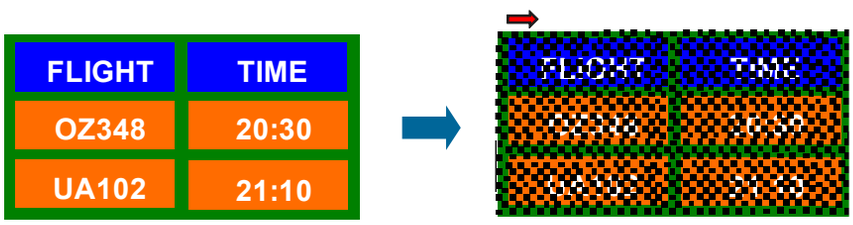


- Type 1. Screen Scroll : Screen is automatically scrolled



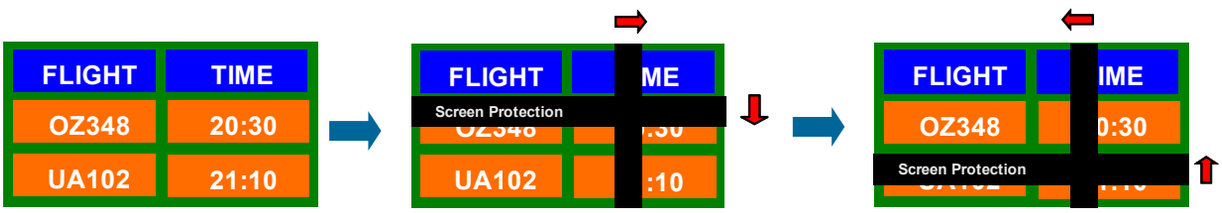

Interval : 1 ~ 10 hour (Recommend : 1)
Second : 1 ~ 5 second (Recommend : 5)

- Type 2. Pixel : One dot on/off and move




Interval : 1 ~ 10 hour (Recommend : 1)
Second : 10 ~ 50 second (Recommend : 50)

- Type 3. Bar : 2 bars move with crossing each other




Interval : 1 ~ 10 hour (Recommend : 1)
Second : 10 ~ 50 second (Recommend : 50)

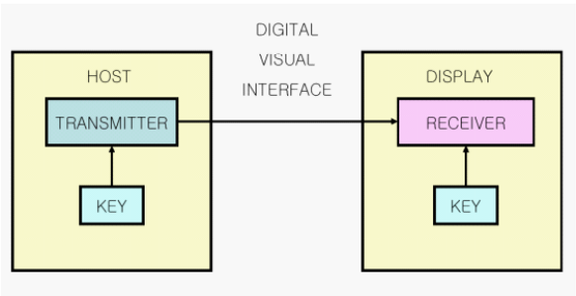
- Type 4. Eraser : 2 blocks move with erasing the display

Interval : 1 ~ 10 hour (Recommend : 1)
Second : 10 ~ 50 second (Recommend : 50)

## ■ HDCP Operation

♦ HDCP: A decoding function designed to protect digital content included in HDMI signals.

♦ The operating diagram below shows how the picture is displayed when a device that has the HDCP feature is connected to a monitor that contains an HDCP authentication code. The picture is displayed after an authentication (decoding) process via the HDMI's I2C line.




1. Authentication takes about 2 seconds.
2. If authentication fails: A static screen will be displayed.

→ Check the supported resolution.
Turn the power switch off and on (for re-authentication).
Enter the HDCP key again.
Check that the device supports HDCP authentication.

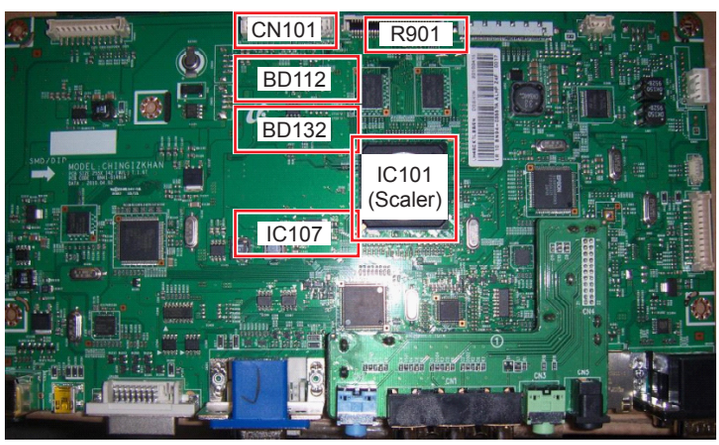
# Memo

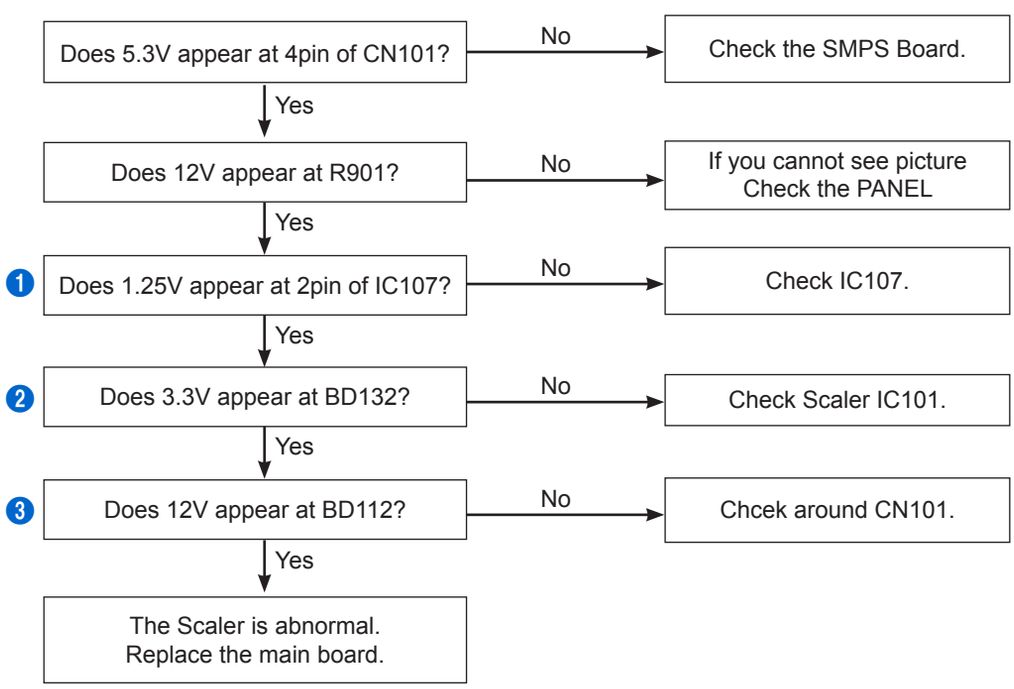
# 4. Troubleshooting

## 4-1. Troubleshooting

1. Before troubleshooting, setup the PC ‘s display as below.
   • Resolution: 1366 X 768
   • H-frequency: 66 kHz
   • V-frequency: 60Hz
2. If no picture appears, make sure the power cord is correctly connected.
3. Check the following circuits.
   • No raster appears: Function PCB, Main PCB, I/P PBA
   • 55V develop but no screen: Main PBA
   • 5V does not develop: I/P PBA
4. After soft power turn off, push the mute → 1 → 8 → 2 → power on and so enter the Service Menu.
   If you choose the reset, the monitor automatically returns to factory reset.

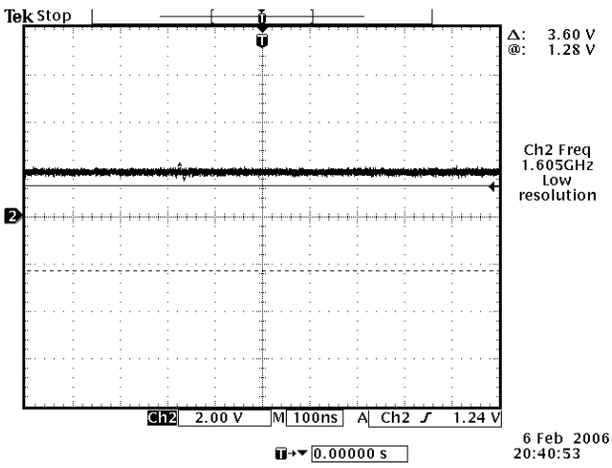
# 4-2. No Power

| | |
|---|---|
| Symptom | – When turning on the Power button after connecting the power, the LED at the front of the monitor does not operate. |
| Major checkpoints | – Check the SMPS board power fuse and the SMPS board output power.<br>– Check the connections for the SMPS board and the Main board inside the monitor.<br>– Check the Main board power part and check also whether there is any abnormal output at other output terminals. |
| Diagnostics |  |
| Caution | Make sure to disconnect the power before working on the SMPS board. |

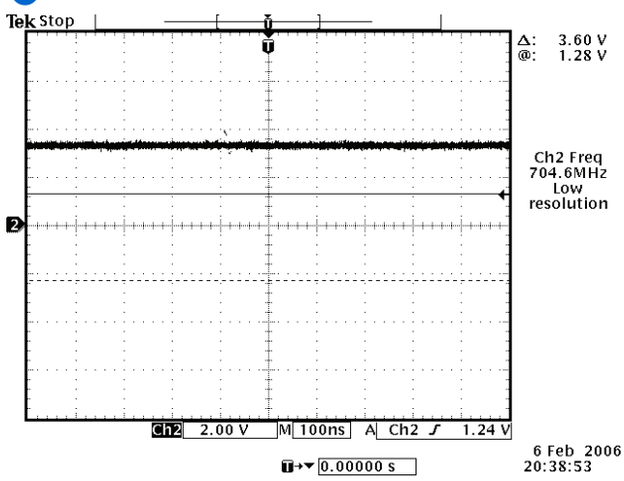


## 4-2-1. Waveform

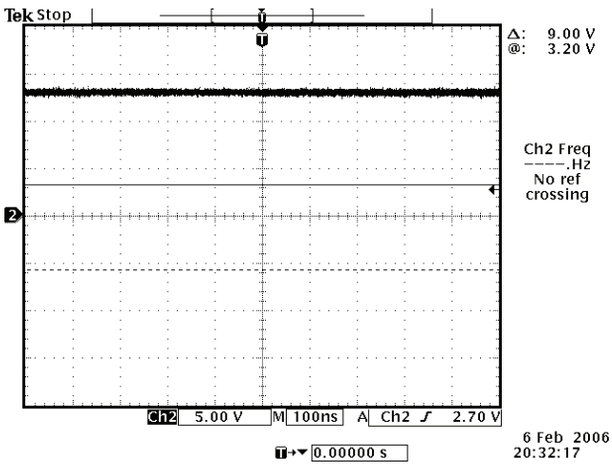
1



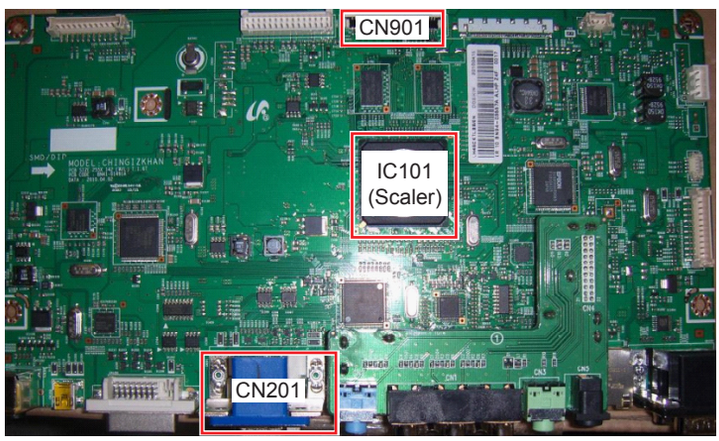

2

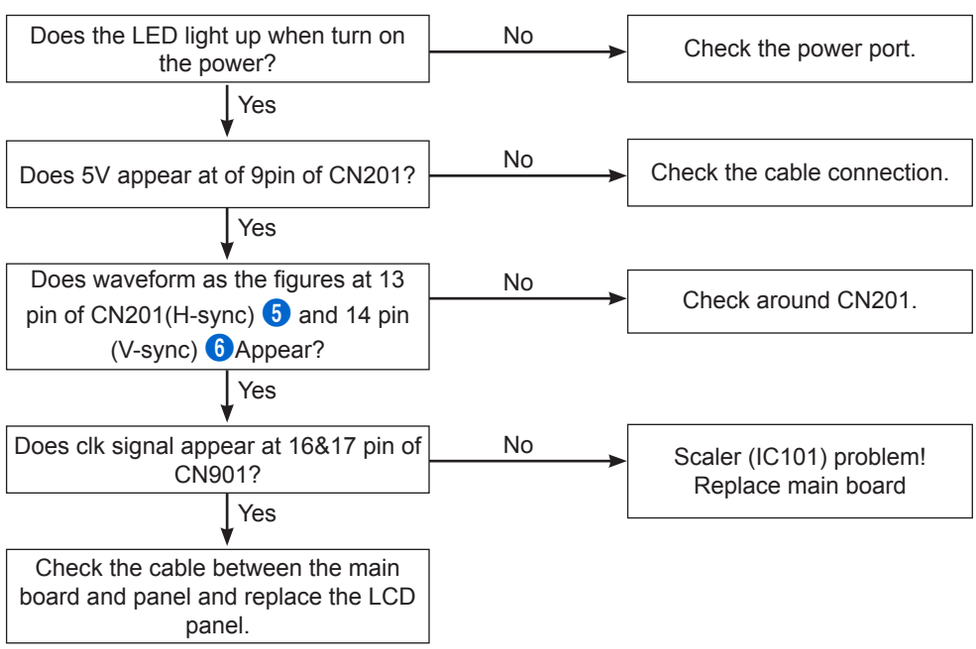



3



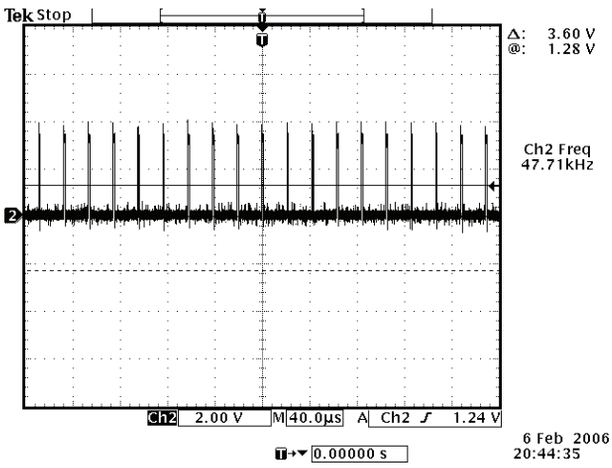
# 4-3. No PC / Component / AV (D-SUB) Picture

| | |
|---|---|
| Symptom | – Though the LED power turns on, the screen is blank when connecting the VGA cable. |
| Major checkpoints | – Check the D-sub cable connections.<br>– Check whether the LVDS cable is connected correctly to the panel.<br>– Check whether the lamp connector of the panel is connected correctly to the SMPS board. |
| Diagnostics |  |
| Caution | Make sure to disconnect the power before working on the SMPS board. |

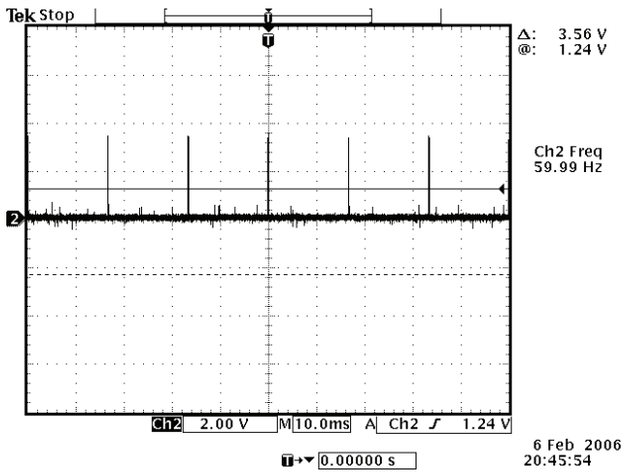

Does the LED light up when turn on the power?
No
Check the power port.
Yes
Does 5V appear at of 9pin of CN201?
No
Check the cable connection.
Yes
Does waveform as the figures at 13 pin of CN201(H-sync) 5 and 14 pin (V-sync) 6 Appear?
No
Check around CN201.
Yes
Does clk signal appear at 16&17 pin of CN901?
No
Scaler (IC101) problem! Replace main board
Yes
Check the cable between the main board and panel and replace the LCD panel.

## 4-3-1. Waveform

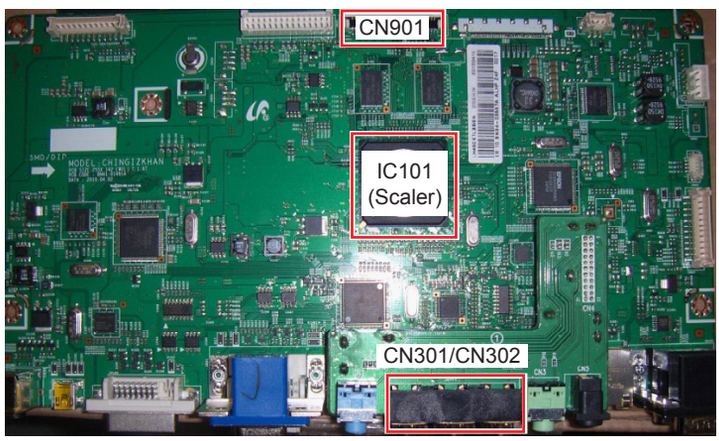
5

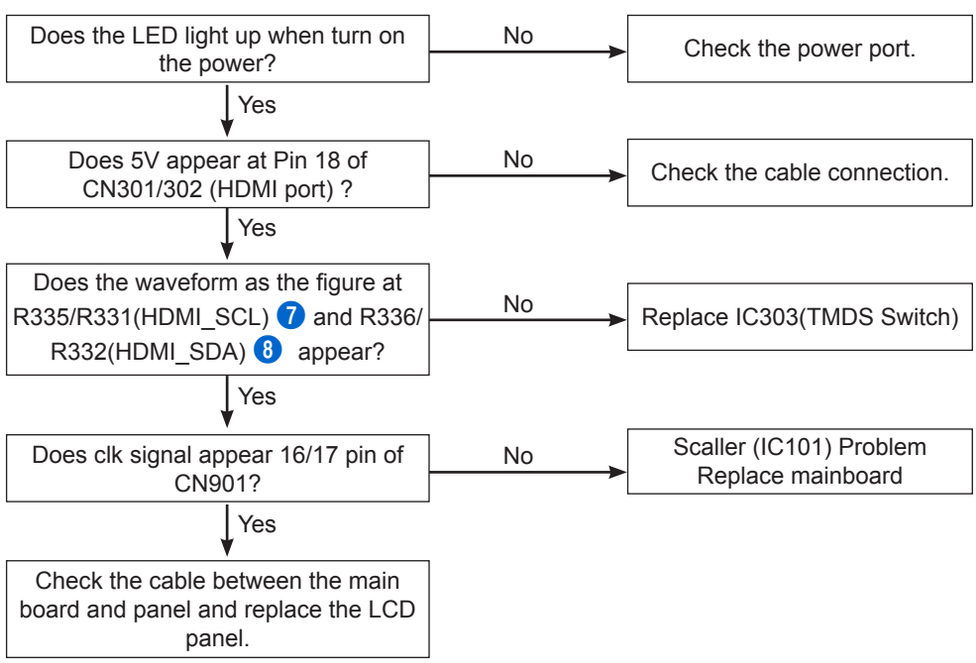



6



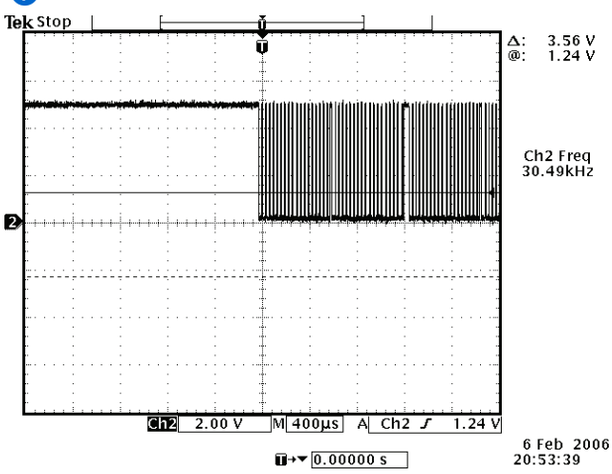
# 4-4. No HDMI Video

| | |
|---|---|
| Symptom | – The LED power turns on but the screen is blank when the HDMI cable is connected. |
| Major checkpoints | – Check the HDMI cable connections.<br>– Check whether the LVDS cable is connected correctly to the panel.<br>– Check whether the lamp connector of the panel is connected correctly to the SMPS board. |
| Diagnostics |  |
| Caution | Make sure to disconnect the power before working on the SMPS board. |

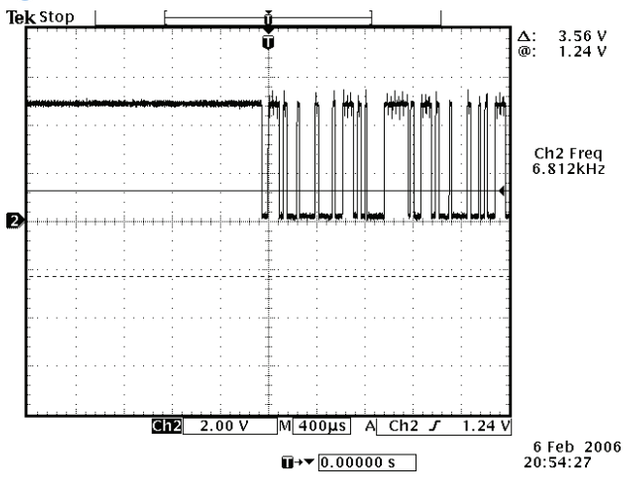

Does the LED light up when turn on the power?
No
Check the power port.
Yes
Does 5V appear at Pin 18 of CN301/302 (HDMI port) ?
No
Check the cable connection.
Yes
Does the waveform as the figure at R335/R331(HDMI_SCL) 7 and R336/ R332(HDMI_SDA) 8 appear?
No
Replace IC303(TMDS Switch)
Yes
Does clk signal appear 16/17 pin of CN901?
No
Scaller (IC101) Problem Replace mainboard
Yes
Check the cable between the main board and panel and replace the LCD panel.

## 4-4-1. Waveform

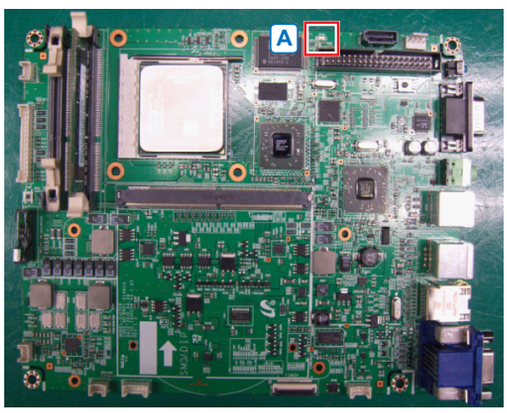
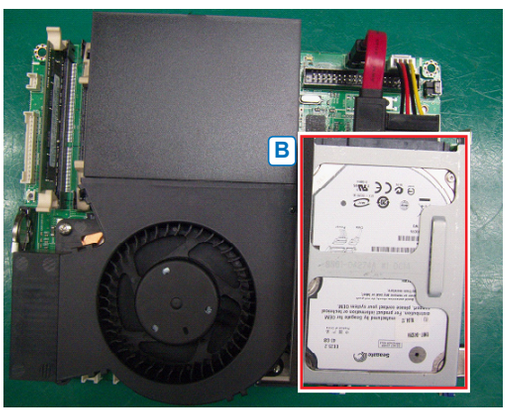
7




8

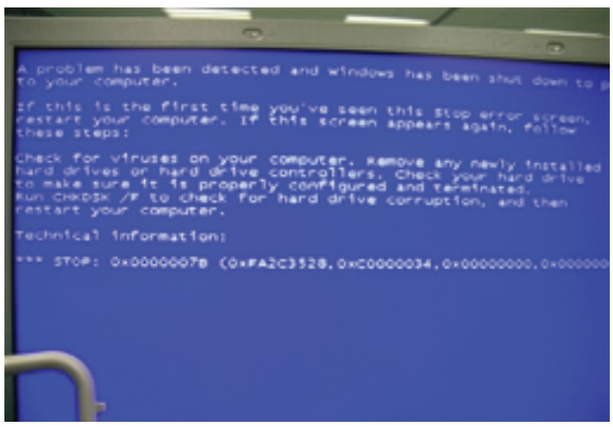


# 4-5. O/S Problems

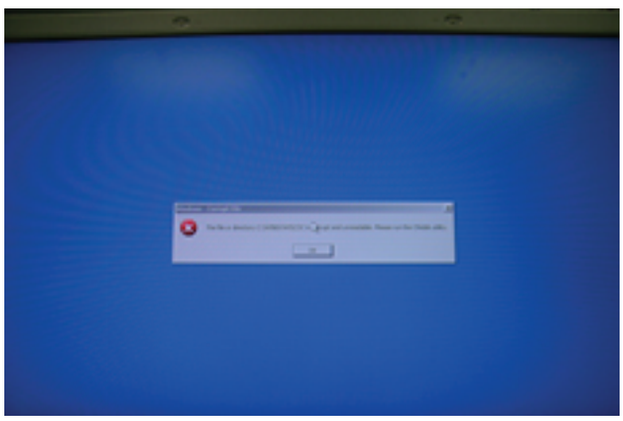
| | |
|---|---|
| Symptom | – The monitor does not boot. |
| Major checkpoints | – Check the BNC cable connections.<br>– Check whether the LVDS cable is connected correctly to the panel.<br>– Check whether the lamp connector of the panel is connected correctly to the SMPS board. |
| Diagnostics |  <br>  <br>When turning on power in Magic Info mode, Does the Sam Sung Logo appear on display? → No → Check the LED. A<br>↓ Yes<br>Does appear Blue Screen as like 9? → No → Restore OS Image or Replace HDD. B<br>↓ Yes<br>During the Booting ,Does appear error message as like 10. → No → Restore OS Image or Replace HDD. B<br>↓ Yes<br>Check the CPU and DIMM Memory status , And Replace the Network B/D. |
| Caution | Make sure to disconnect the power before working on the SMPS board. |

## 4-5-1. Screens to Check

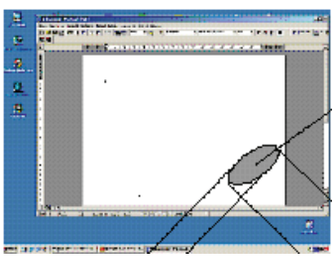
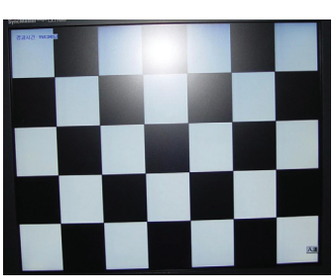
9


A problem has been detected and windows has been shut down to
to your computer.
If this is the first time you've seen this Stop error screen,
restart your computer. If this screen appears again, follow
these steps:
Check for viruses on your computer. Remove any newly installed
hard drives or hard drive controllers. Check your hard drive
to make sure it is properly configured and terminated.
Run CHKDSK /F to check for hard drive corruption, and then
restart your computer.
Technical information:
*** STOP: 0x0000007B (0xFA2C3528,0xC0000034,0x00000000,0x000000

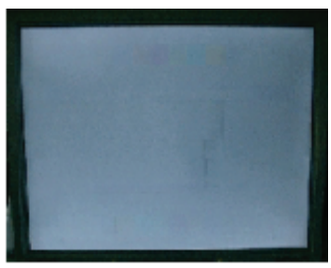
10



# 4-6. Faults and Corrective Actions

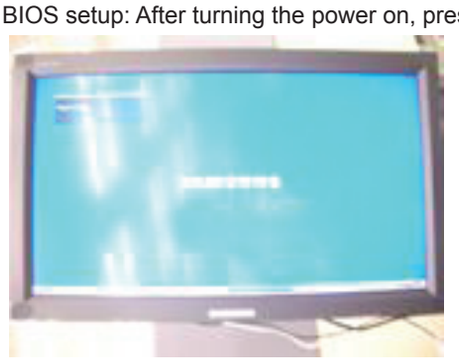
| Category | Defect symptoms and Actions taken | Remarks |
|---|---|---|
| Defect correction history | Model: 400PXn Beethoven 2<br>CPU Socket problem<br>- Symptoms: Various defects found in marketed products<br>- Windows boot-up failure, Windows freeze-up, Windows restart, Blue screen, Windows error message, etc.<br>- Causes: Poor contact occurred between the CPU and the CPU socket due to the CPU socket's structural problem and strain.<br>1) Structural problem in the CPU socket<br>2) Strain due to the gap pad's thickness between the CPU heat sink and the instrument's shield cover.<br>- Actions taken:<br>1) Requested Foxconn, CPU socket manufacturer, to change the shape of the socket's contact area: to lengthen the pin's contact or to reshape the contact area into a hook shape.<br>2) The PBA line performed shock tests during a performance test on the network board to sort out defective sockets<br>3) Changed the gap pad's thickness (from 3.2mm to 2.0mm) |  |
| Defect correction history | Model: 400PXn Beethoven 2<br>Problems: Defects in Samhwa's 16V 100uF Caps and field defects in Japan for the Beethoven 2 model<br>Symptoms: Sound noise when opening Caps (Japan, Dec. '07)/ BNC screen noise when opening TSED PBA Caps (Jan. '08)<br>Actions taken: Took temporary measures<br>- Samhwa in Tianjin discontinued manufacturing 100uF/16V, which was supplied by Samhwa in Korea instead. (Jan. 30)<br>- after an alternative was set up, manufacturing was carried out to successfully cover the production volume, which was originally to be supplied by Tianjin, in December before Jan. 30<br>- Performed a comparative analysis of 100uF/16V M-Type (105 degree, 3000 hour) between Korea and Tianjin Samhwa<br>- Performed a comparative analysis of Tianjin's production volume between July ~ Aug. and Dec. (Jan. 29)<br>- Established a dualization schedule - development evaluation (Jan. 25)<br>- Set up alternative measures and notified results (parts warranty) (notified later) |  |

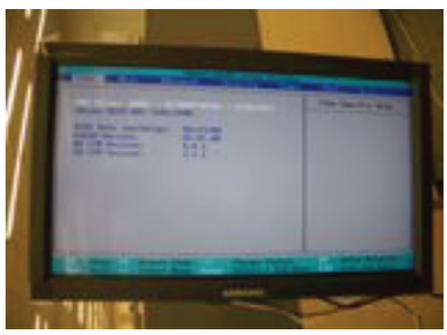
| Category | Defect symptoms and Actions taken | Remarks |
|---|---|---|
| Defect correction history | Model: 400PXn/ DXn Beethoven 2/ Beethoven Plus - EWF related<br>- EWF (Enhanced Writer Filter)?<br>Protects booting volume in unnecessary writing; improves system robustness; protects booting volume from possible power failure; protects flash volume from all writings; and increases the life span of flash devices. Preset to Enable by default.<br>- EWF Enable: During system restart after writing data (program installation, contents copy, etc) on the FDM (Flash Disk Module) of the network board, the previously written data will be deleted. Upon leaving the factory, the FDM is divided into C and D drives, in which EWF is set to, respectively, Enable and Disable.<br>- EWF Disable: During system restart after writing data on the FDM, the previous data will remain maintaining the general PC use environment. Powering on or off while EWF is on Disable may cause the corruption of Windows installed on the FDM.<br>- Since there have been many cases that resulted in problems (Windows boot-up failure, blue screen, etc.) while using with EWF Disable, you are recommended to maintain the EWF Enable mode. | |
| Defect correction history | Model: 400PXN<br>- Symptoms: Repeated power ON/OFF<br>Set Open check: Defects in network power (Capxon electrolysis Cap. swelling up) and in the network board (normal screen when detached)<br>- Causes: As the network power does not work from the Capxon electrolysis Cap. swelling up, the system keeps restarting (Cap. life span problem)<br>- Actions taken: Stopped using the Capxon electrolysis Cap. B/S has been complete now.<br><br>♣ Check point: Network power has been changed to one that satisfies 40,00 hour MTBF (BN96-03319A -> BN96-03319B) | |

| Category | Defect symptoms and Actions taken | Remarks |
|---|---|---|
| Defect correction history | Model: 400PXn Beethoven 2 - Power sequence problem<br>- Symptoms: During hard power Off -> On with soft power set to Off, a defect that the MagicNet source displays only a black screen occurred.<br>- Causes: The MagicNet source displays only a black screen during hard power Off -> On with soft power set to Off.<br>-> This symptom may have two different causes.<br>* Normal condition: The network board, which started up with network power during hard power Off -> On with soft power Off, is shut down by NW_BT. If soft power is turned on again, the network board normally starts up.<br>1) Abnormal condition: If AC power is applied under low AC power and full discharge conditions, NW_BT is ignored and the network board proceeds with booting. If soft power is turned on again, the network board shuts down (black out).<br>2) Abnormal condition: During hard power Off -> On with soft power Off, booting with network power fails.<br>=> On the contrary, booting by NW_BT is achieved. If soft power is turned on again, the network board shuts down (black out). Booting with network power is achieved when the ring signal terminal on South Bridge is on High, and if the pin under the terminal is opened, some network boards recognize it as on Low and cause failure.<br>- Actions taken: Corrected the network board's BIOS and Main MICOM Code (the same action taken for both of the above causes) |  |
| Defect correction history | Model: 323T (CK32)<br>- Problems: In the French market, performed follow-up actions on complaints about 323T (CK32) display. The native resolution (1024*768 & 1280*768) of SM323T (CK32) was claimed to be foggy when compared to LG products (Two samples, Jan. 2004).<br>- Causes: The main scaler's sharpness was set to Mini. Addition of an anti-ESD zener diode to the input terminal deteriorated picture quality.<br>- Actions taken: Changed the main scaler's sharpness from 0x00h to 0x18h. Removed the zener diode from the input terminal to replace it with a two-way diode. Modified PCB REV from 458B to 458C.<br><br>♣ CHECK POINT :<br>1> Test pattern: Ran an Internet screen (readability) or test program.<br>- Check list: Blurred/ foggy screen, sharpness, etc.<br>2> Checked if PCB REV for the concerned model was modified (e.g., Chagall 32 inch PCB REV: 458C). | |

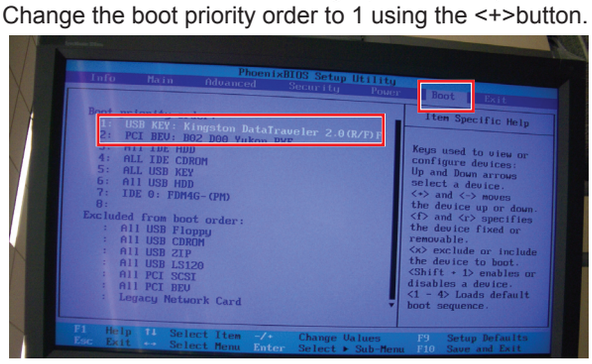
# 4-7. Installing OS (Network)

1. Making a DOS booting USB
   1) Install and run 1123729948_SP27213.exe.
   2) Choose a driver equipped with USB memory and select FAT as the file system.
   3) Decompress EBD.zip which is attached. And select it for location of Format Option-Create a DOS startup disk
2. SFIM Download
   1) Copy the SFIM.exe file from the SFIM Ver. 2.0 folder and paste it to the USB memory root directory.
   2) Remove the USB memory from the PC.
3. When the USB memory is ready, connect the USB keyboard and USB memory to their corresponding USB ports on the network board of the product and then turn the power on.
4. BIOS setup: After turning the power on, press F2 on the screen below to start the BIOS screen.

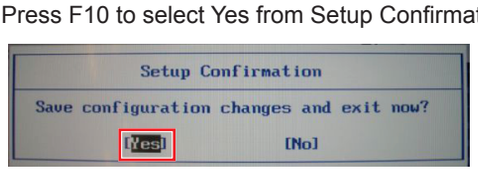




5. Move to <Info>→<Boot> tab using <→> on the keyboard.
   Select the connected USB using <↓> on the keyboard.
   Change the boot priority order to 1 using the <+>button.


PhoenixBIOS Setup Utility
Info
Main
Advanced
Security
Power
Boot
Exit
Item Specific Help
1: USB KEY: Kingston DataTraveler 2.0(R/FD)
2: PCI BEV: B02 D00 Yukon PXE
3: All IDE HDD
4: ALL IDE CDROM
5: ALL USB KEY
6: All USB HDD
7: IDE 0: FDM4G-(PM)
8:
Excluded from boot order:
: All USB Floppy
: All USB CDROM
: All USB ZIP
: All USB LS120
: All PCI SCSI
: All PCI BEV
: Legacy Network Card
Keys used to view or configure devices:
Up and Down arrows select a device.
<+> and <-> moves the device up or down.
<f> and <r> specifies the device fixed or removable.
<x> exclude or include the device to boot.
<Shift + 1> enables or disables a device.
<1 - 4> Loads default boot sequence.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

6. Press F10 to select Yes from Setup Confirmation and press Enter.

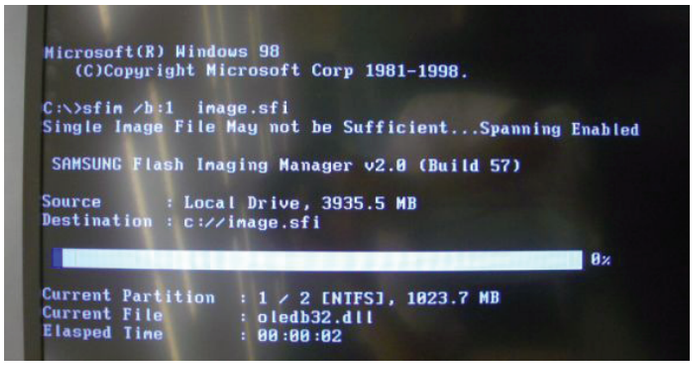



7. Running SFIM
   After BIOS setup,  it operates Command Prompt .
   Type the command as below.

```
C : \>   sfim   /r:1   image.sfi
```

   In image.sfi, the image can be changed randomly (e.g., 320MX.sft, etc.).

1. If the blue progress bar reaches its fullest extent (100%), it means that the process is complete. Turn the LCD monitor off.


Microsoft(R) Windows 98
(C)Copyright Microsoft Corp 1981-1998.
C:\>sfin /b:1 image.sfi
Single Image File May not be Sufficient...Spanning Enabled
SAMSUNG Flash Imaging Manager v2.0 (Build 57)
Source : Local Drive, 3935.5 MB
Destination : c://image.sfi
0%
Current Partition : 1 / 2 [NTFS], 1023.7 MB
Current File : oledb32.dll
Elasped Time : 00:00:02

2. Remove the USB memory from the main body of the LCD monitor.

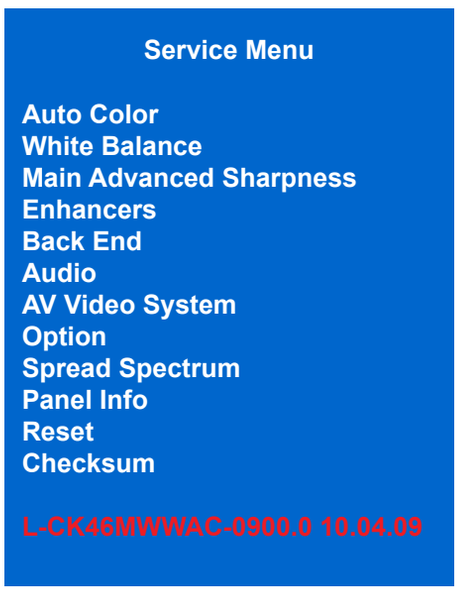
# 4-8. Adjustment

## 4-8-1. Entering Service Mode with Remote Control

1. Entering Service Mode

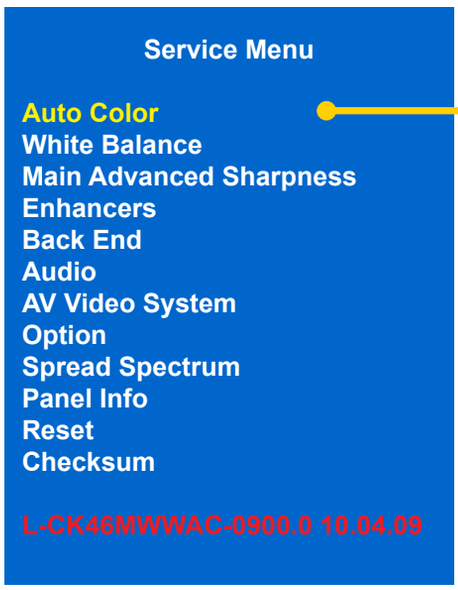
- Power Off → MUTE → 1 → 8 → 2 → Power On
- INFO → FACTORY (Using factory Remocon)

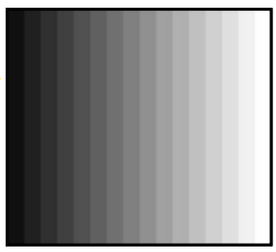
## 4-8-2. Service Mode Menu




| Menu | Description |
|---|---|
| Auto Color | Auto-Color Adjusting |
| White Balance | Adjust color by R/G/B Offset, Gain |
| Main Advanced Sharpness | Improving Sharpness |
| Enhancers | Enhance Image quality |
| Back End | |
| Audio | Setting the Audio delay |
| AV Video System | Y and C Sync Control |
| Option | Adjust Baudrate, nMFM/Function Key Operation, and so on. |
| Spread Spectrum | Spread Spectrum |
| Panel Info | Panel using time, replacing times |
| Reset | Factory Reset |
| Checksum | Micom Code version and Date |

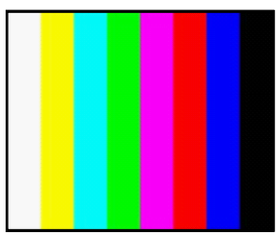
## ■ AutoColor Part



PC analog Only ( 1024x768@60 16gray pattern)
Color control operates normally only in certain modes of certain patterns, but in other cases, the operation may distort color. Also, color control is not normal when controlling color in a mode other than XGA 60Hz.

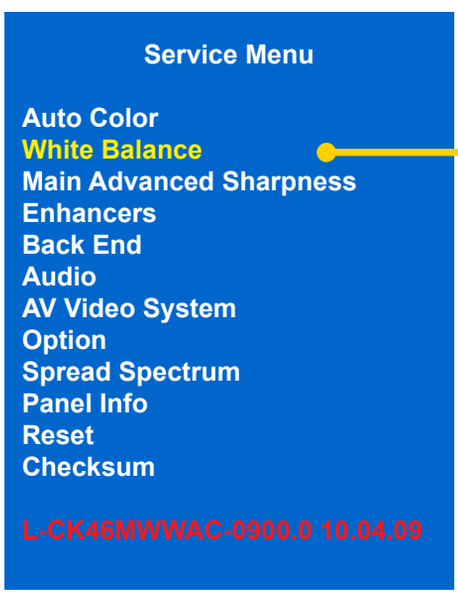
Extreme caution needed.!!



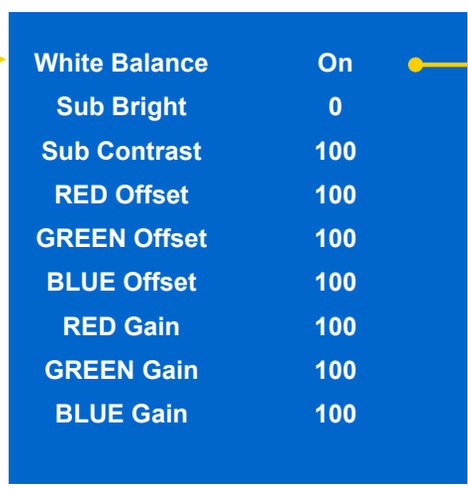
AV (NTSC or PAL, Color bar pattern)
Component ( 720P, Color bar pattern)
Color control operates normally only in certain modes of certain patterns, but in other cases, the operation may distort color.

Extreme caution needed.!!

## ■ White Balance Part




Used for color control.
But excessive setting may saturate the color.
Extreme caution needed.!!



On : Display factory adjusting value
Off : Display default setting value

Register value in the Scaler
RED / BLUE / GREEN
Adjust the Gain and Offset

## ■ Sharpness Part

**Service Menu**

- Auto Color
- White Balance
- Main Advanced Sharpness
- Enhancers
- Back End
- Audio
- AV Video System
- Option
- Spread Spectrum
- Panel Info
- Reset
- Checksum

L-CK46MWWAC-0900.0 10.04.09

Adjusting the sharpness of displayed image.

| | |
|---|---|
| Main V Peaking Y | 32 |
| Main V Peaking UV | 16 |
| Main V Peaking Coring | 16 |
| Main V Peaking Region 1 Threshold | 48 |
| Main V Peaking Region 1 Gain | 4 |
| Main V Peaking Region 2 Threshold | 170 |
| Main V Peaking Region 2 Gain | 4 |
| Main H Peaking Y | 32 |
| Main H Peaking UV | 16 |
| Main H Peaking Coring | 8 |
| Main H Peaking Region 1 Threshold | 48 |
| Main H Peaking Region 1 Gain | 4 |
| Main H Peaking Region 2 Threshold | 170 |
| Main H Peaking Region 2 Gain | 4 |
| Sharpness Noise Coring | |

- Adaptive
- Low
- High
- Medium
- Off

- Main V Peaking Y
- Main V Peaking UV
- Main V Peaking Coring
- Main V Peaking Region 1 Threshold
- Main V Peaking Region 1 Gain
- Main V Peaking Region 2 Threshold
- Main V Peaking Region 2 Gain
- Main H Peaking Y
- Main H Peaking UV
- Main H Peaking Coring
- Main H Peaking Region 1 Threshold
- Main H Peaking Region 1 Gain
- Main H Peaking Region 2 Threshold
- Main H Peaking Region 2 Gain
- Sharpness Noise Coring

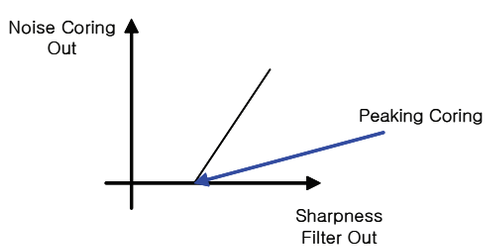
**Scaling Filter Sharpness Control - Peaking Y / Peaking UV**

Adjusts the sharpness of brightness (Y) and color tone (UV). When in the range of 1-127 the higher the number the sharper the image, and when in the range of 128-255 the higher the number the softer the image.

If the sharpness is at too high of a level then it may cause side effects such as more apparent image noise, etc.

**Noise Coring Control - Peaking Coring**

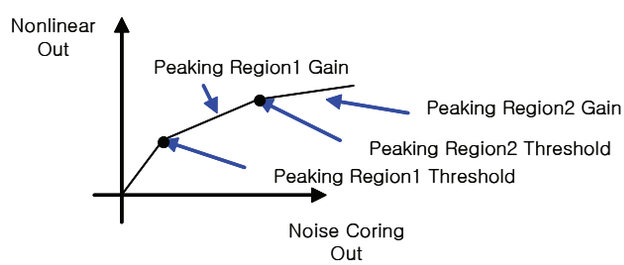
Represents only large edges of images vividly, instead of amplifying small edges assuming that they are noise.



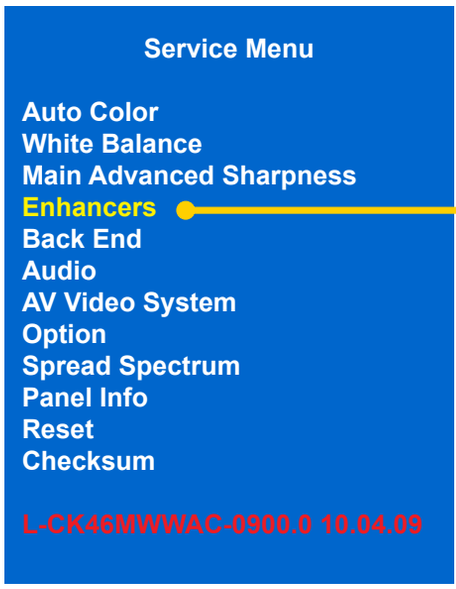

Determines a threshold value to highlight sharpness.

**NonLinear Sharpness Control - Peaking Resion1/2 Threshold, Gain**

Instead of applying sharpness evenly to the entire image, divides frequencies into sections applying different gains for each section.



## ■ Enhancers Part




Adjust to display the clear and sharp image.

This function is used to adjust the appropriate value for each target region. Change only when it is needed.

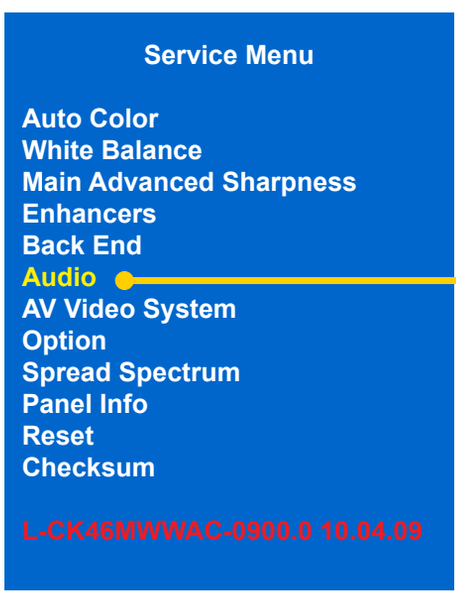
| | |
|---|---|
| HLE Threshold | 10 |
| HLE Gain | 180 |
| HDP Threshold | 21 |
| HDP Gain | 71 |
| HCE Threshold | 15 |
| HCE Gain | 25 |
| VDP Threshold | 27 |
| VDP Gain | 3 |

HLE : Horizontal Large Edge Enhancer

HDP : Horizontal Detail Processor

HCE : Horizontal Chroma Enhancer

## ■ Audio Part

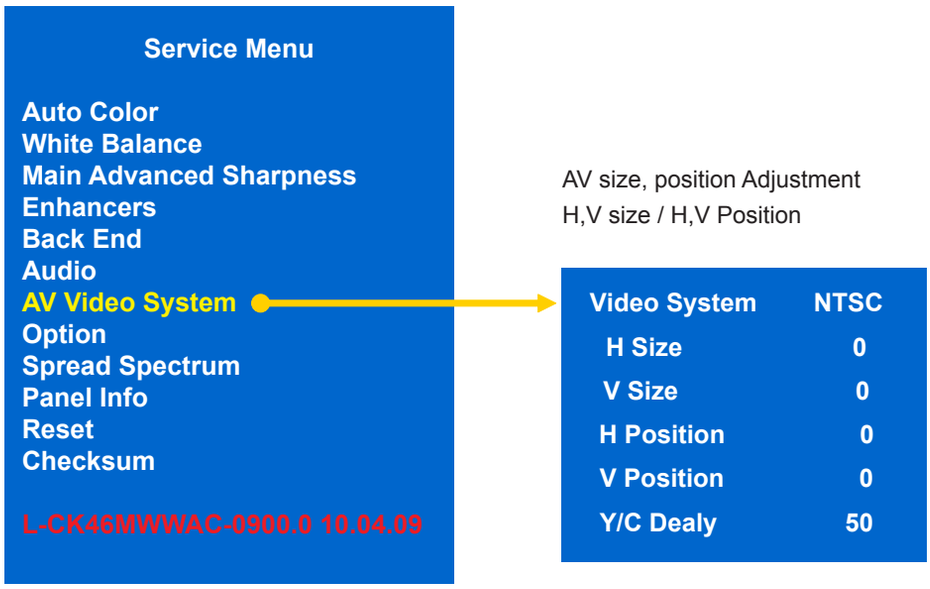



Audio delay Setting (Set for the video and audio synchronization.)

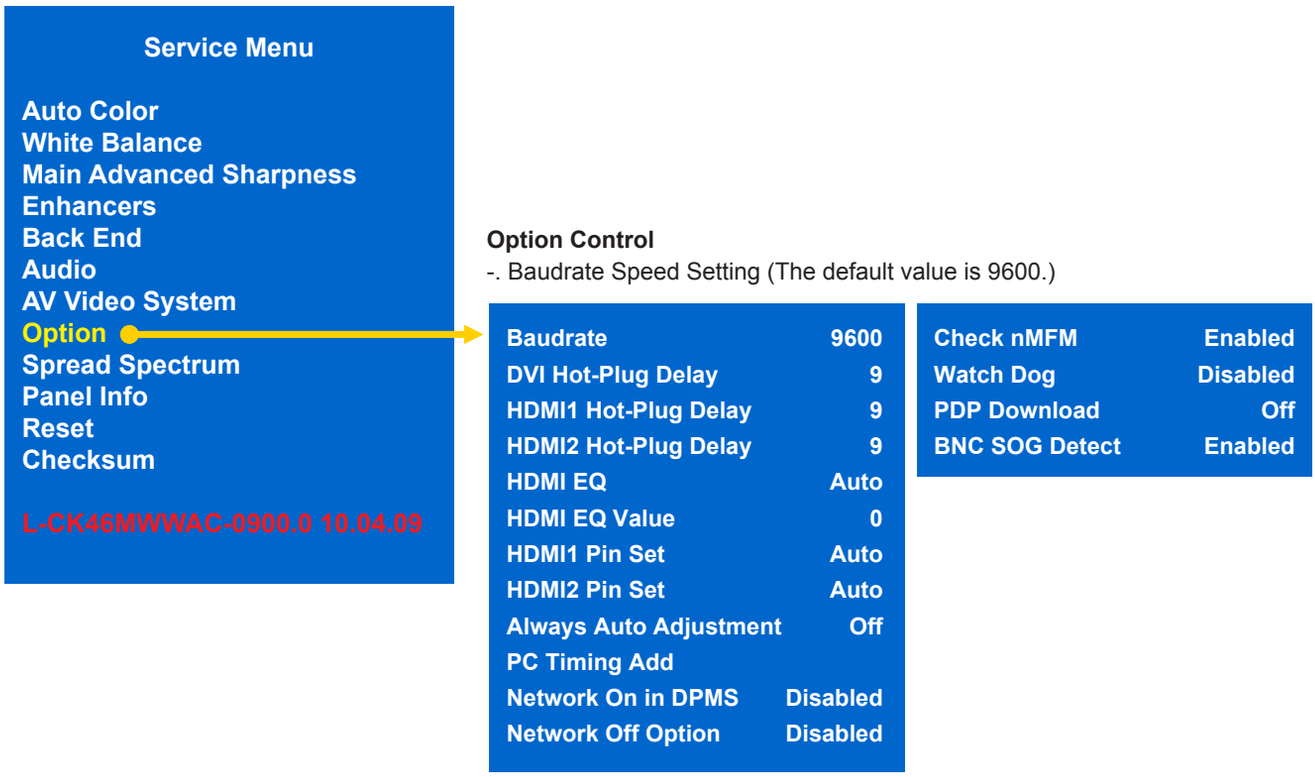
| | |
|---|---|
| AUDIO DELAY | ON |
| PC Audio Delay | 0 |
| DVI Audio Delay | 0 |
| AV Audio Delay | 0 |
| Component Audio Delay | 0 |
| HDMI1 Audio Delay | 0 |
| HDMI2 Audio Delay | 0 |
| DisplayPort Audio Delay | 0 |
| Magicinfo Audio Delay | 0 |
| TV (Internal] Audio Delay | 0 |
| TV (External) Audio Delay | 0 |
| EXT Volume Scale | 100 |

| | |
|---|---|
| Speaker EQ | On |
| EXT Prescale Speaker | 100 |

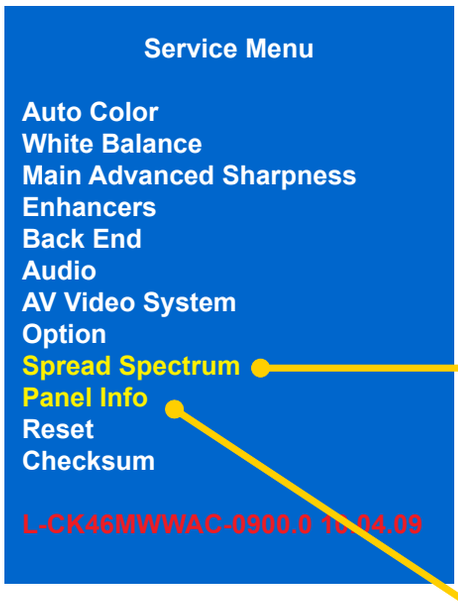
## ■ AV Video System Part



## ■ Option Part


Service Menu
Auto Color
White Balance
Main Advanced Sharpness
Enhancers
Back End
Audio
AV Video System
Option
Spread Spectrum
Panel Info
Reset
Checksum
L-CK46MWWAC-0900.0 10.04.09
Option Control
-. Baudrate Speed Setting (The default value is 9600.)
Baudrate 9600
DVI Hot-Plug Delay 9
HDMI1 Hot-Plug Delay 9
HDMI2 Hot-Plug Delay 9
HDMI EQ Auto
HDMI EQ Value 0
HDMI1 Pin Set Auto
HDMI2 Pin Set Auto
Always Auto Adjustment Off
PC Timing Add
Network On in DPMS Disabled
Network Off Option Disabled
Check nMFM Enabled
Watch Dog Disabled
PDP Download Off
BNC SOG Detect Enabled

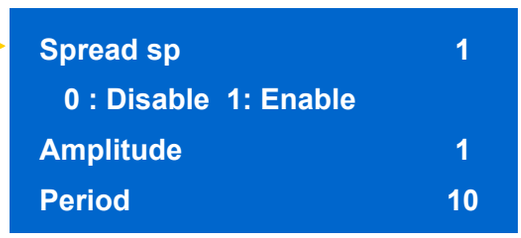
## ■ Spread Spectrum/Panel Info Part



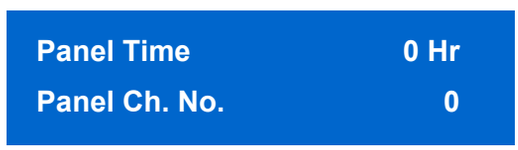

**Spread Spectrum Adjustment**

The application status of Spread spectrum

Amplitude and Period Setting



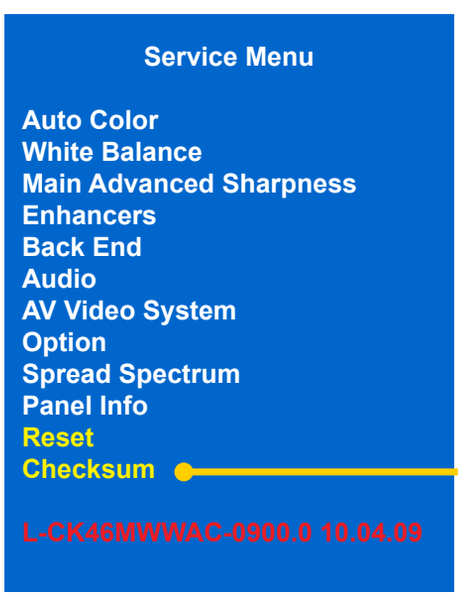

Information of Panel




Panel Time: the total operating hours of the panel is 0 Hr (default).

Panel Ch. No.: the panel has been replaced 0 times (default; increases by one every time the panel is replaced)

## ■ Reset/Checksum Part




Reset : Factory Reset

Reset the setting on the Service Menu to the default setting.

Need to turn the Power On/Off after reset

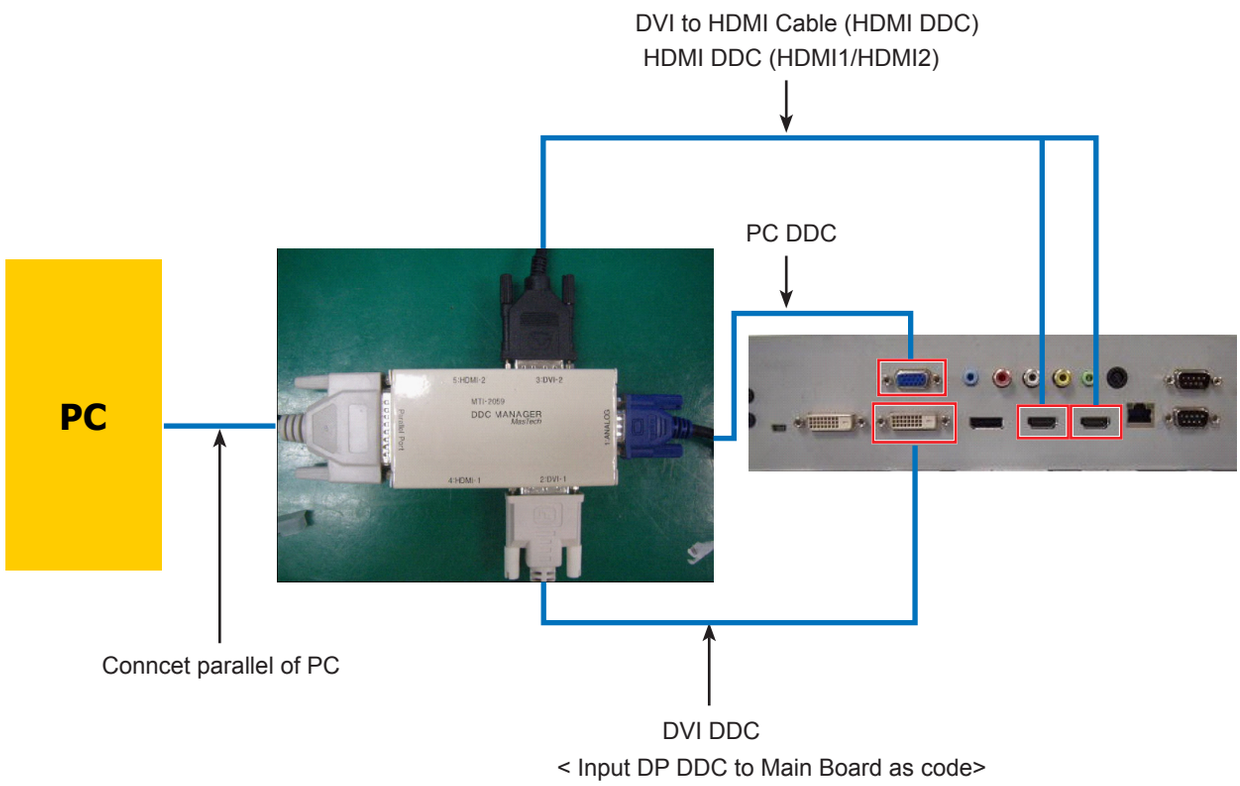
**Checksum**

The 4 digit serial number regarding the micom code is displayed if you select this.

## 4-8-3. Entering DDC

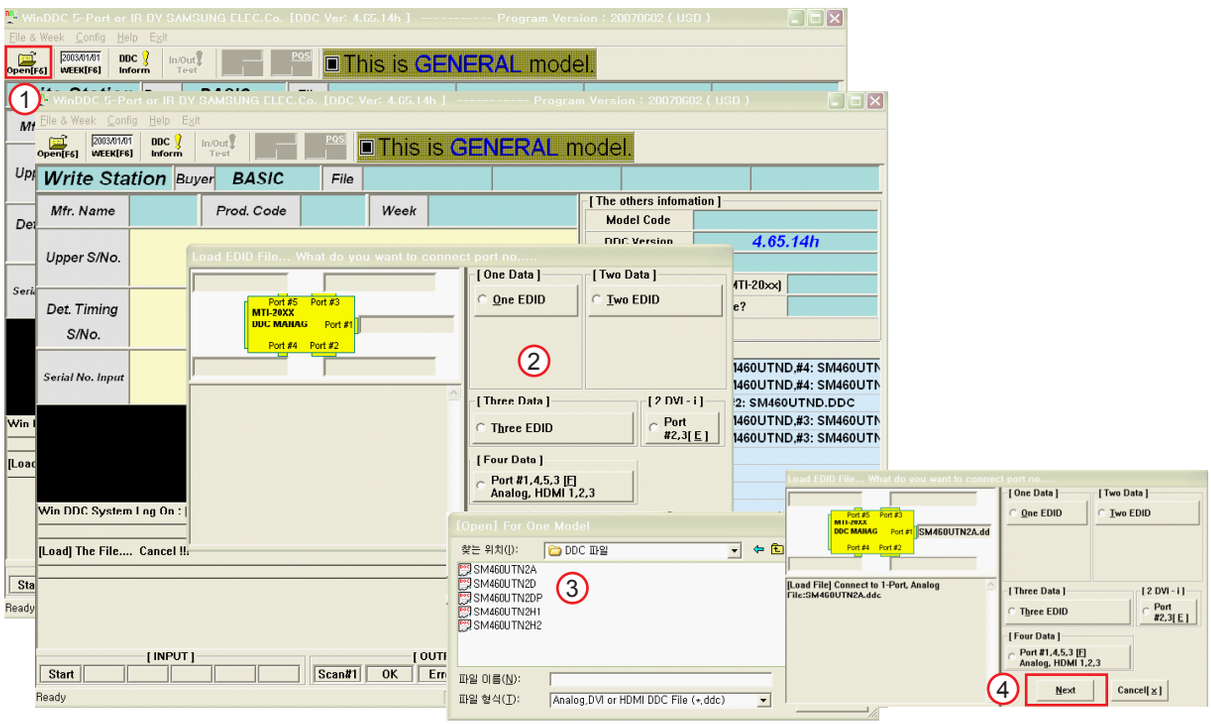
Connect the parallel port (printer port) of the PC and the D-SUB/DVI/HDMI cable of the monitor by using the DDC manager jig.

For the connection, refer to the following figure.



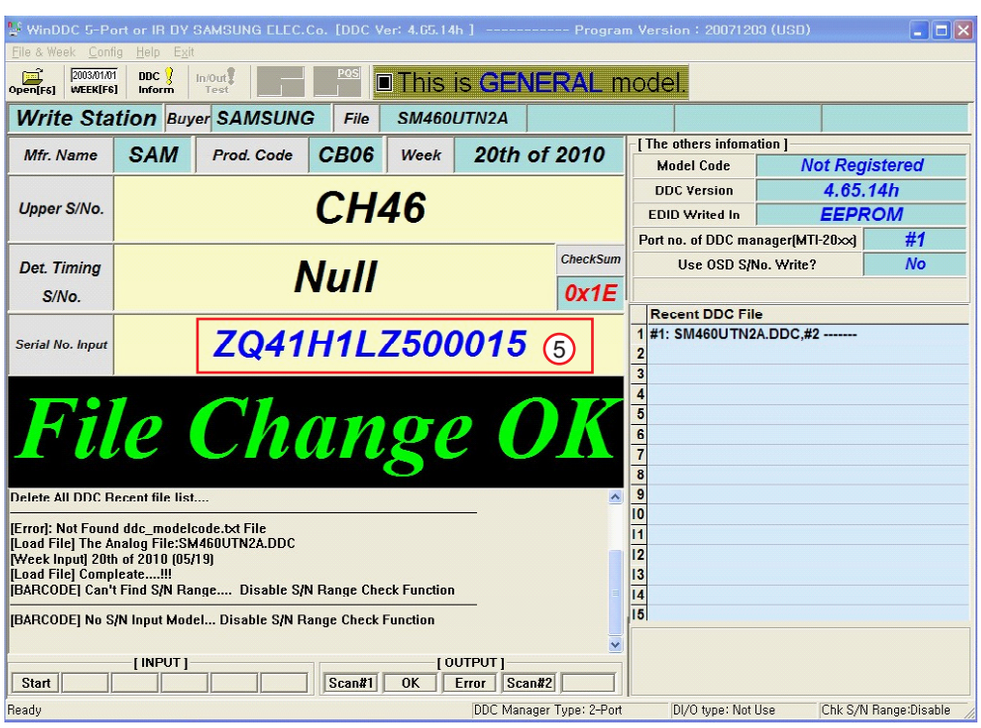
**Input Procedures**

1. Select Open File
2. Select Port 1 (D-SUB) / Select Port 2 (DVI) / Select Port 3 (HDMI)
3. Select the DDC file.
4. Click the Next (OK) button.




5. Enter the serial number of the monitor.

When Digital is input after Analog is input, repeat Steps 2~5.



## ■ Must Do’s after replacing the board

1. Main Board

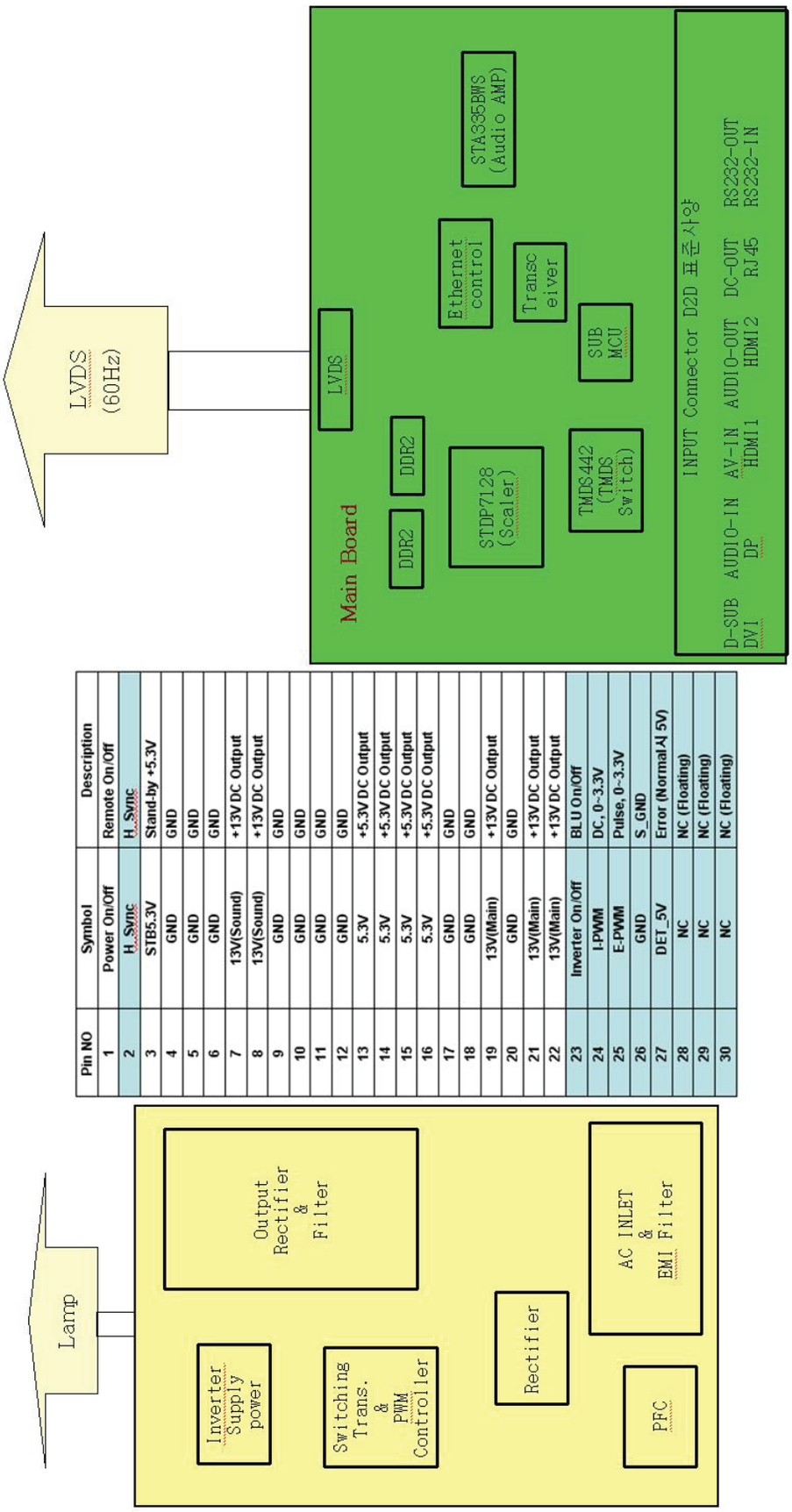
- ▶ Check the adjusted PC color status
- ▶ DDC Input (Input both Analog and Digital)
  - This is for registering information about the supported resolution.
  - The product serial number and EDID should also be entered.
- ▶ Reset after entering the Service mode and turn off the main power.

2. Network Board

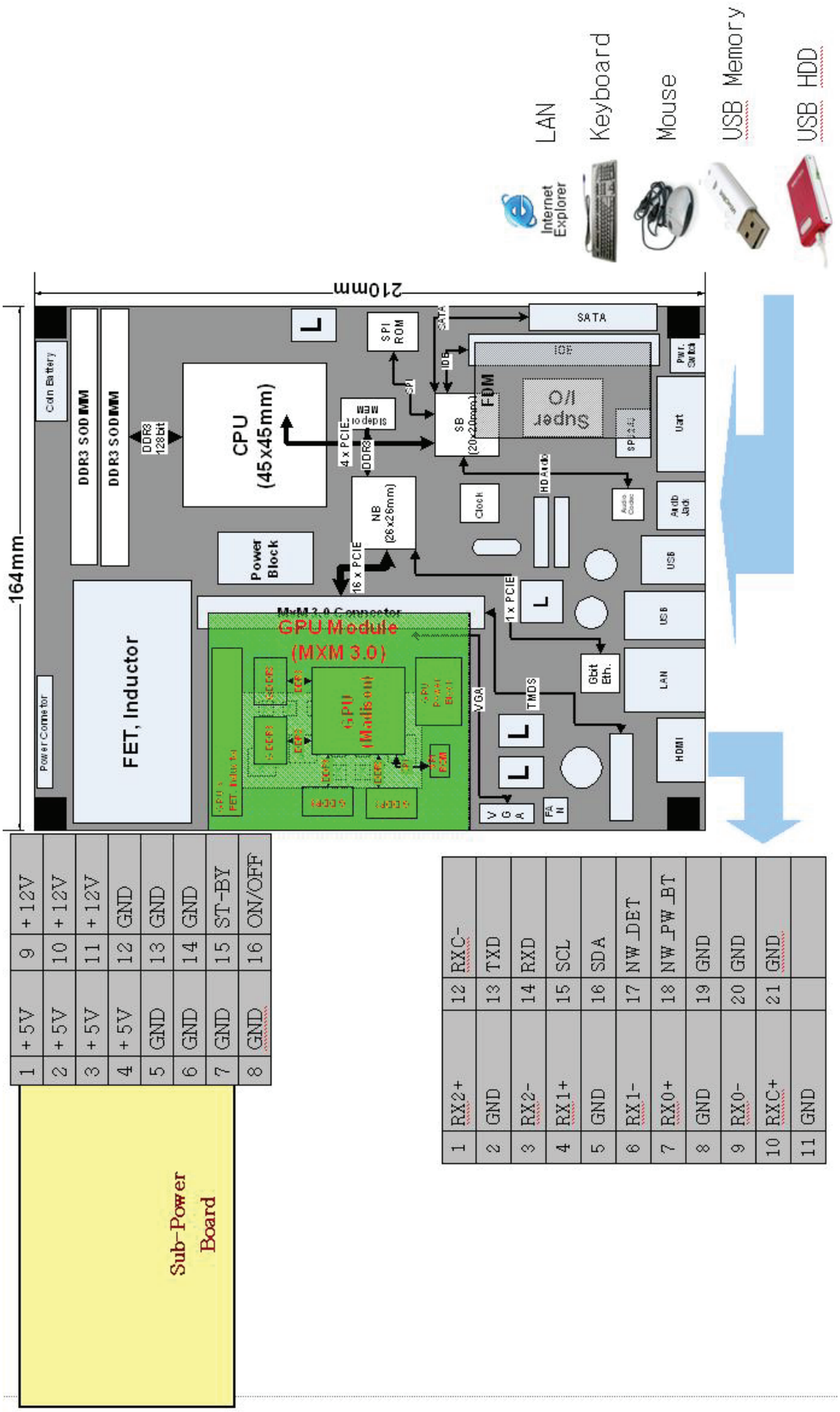
- ▶ Press Info and check the version of Network.
- ▶ Check the versions of  HDD and BIOS and see if they are the same as the version of the server program.
- ▶ If the version is different, refer to the descriptions above and upgrade the program.
- ▶ Upgrade the program and turn the power off/on.
- ▶ Check if there are IC-DRAM and Battery.

# 6. Wiring Diagram

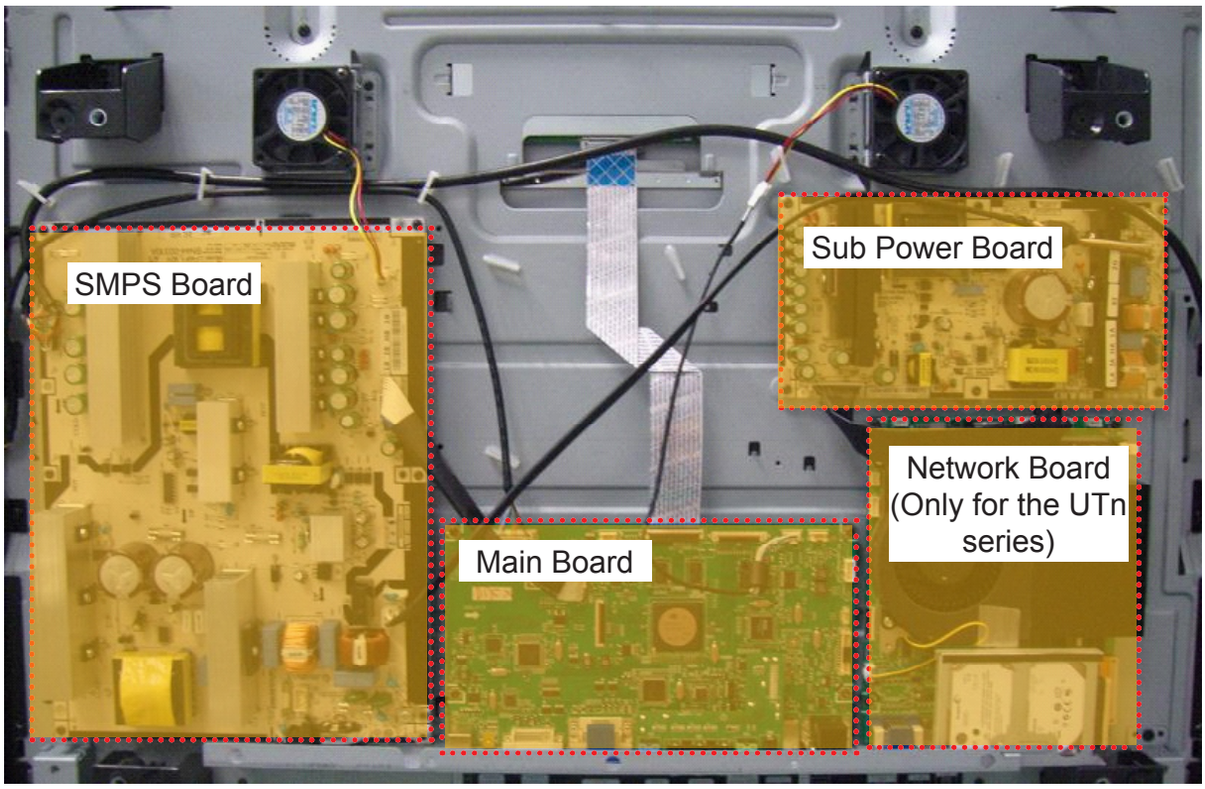
## 6-1. Wiring Diagram



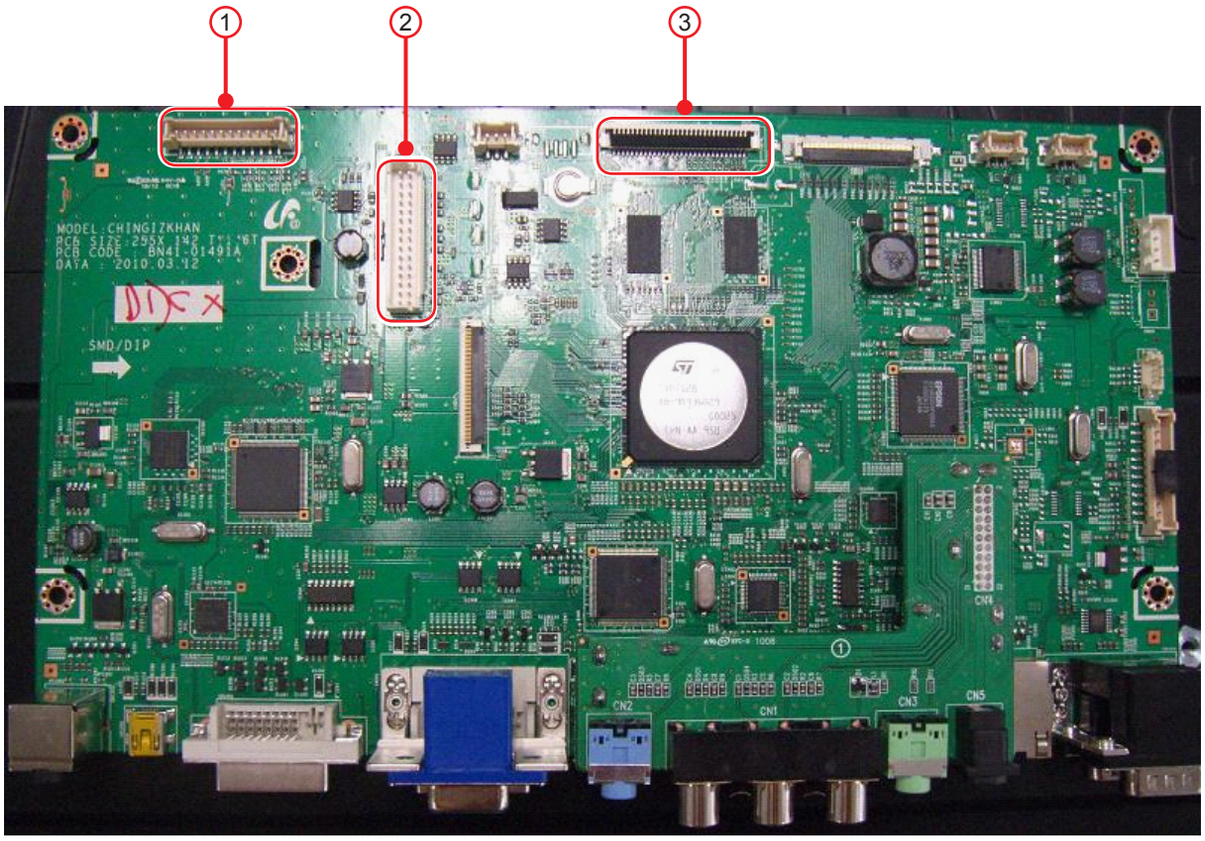

| Pin NO | Symbol | Description |
|---|---|---|
| 1 | Power On/Off | Remote On/Off |
| 2 | H_Sync | H_Sync |
| 3 | STB5.3V | Stand-by +5.3V |
| 4 | GND | GND |
| 5 | GND | GND |
| 6 | GND | GND |
| 7 | 13V(Sound) | +13V DC Output |
| 8 | 13V(Sound) | +13V DC Output |
| 9 | GND | GND |
| 10 | GND | GND |
| 11 | GND | GND |
| 12 | GND | GND |
| 13 | 5.3V | +5.3V DC Output |
| 14 | 5.3V | +5.3V DC Output |
| 15 | 5.3V | +5.3V DC Output |
| 16 | 5.3V | +5.3V DC Output |
| 17 | GND | GND |
| 18 | GND | GND |
| 19 | 13V(Main) | +13V DC Output |
| 20 | GND | GND |
| 21 | 13V(Main) | +13V DC Output |
| 22 | 13V(Main) | +13V DC Output |
| 23 | Inverter On/Off | BLU On/Off |
| 24 | I-PWM | DC, 0~3.3V |
| 25 | E-PWM | Pulse, 0~3.3V |
| 26 | GND | S_GND |
| 27 | DET_5V | Error (Normal At 5V) |
| 28 | NC | NC (Floating) |
| 29 | NC | NC (Floating) |
| 30 | NC | NC (Floating) |

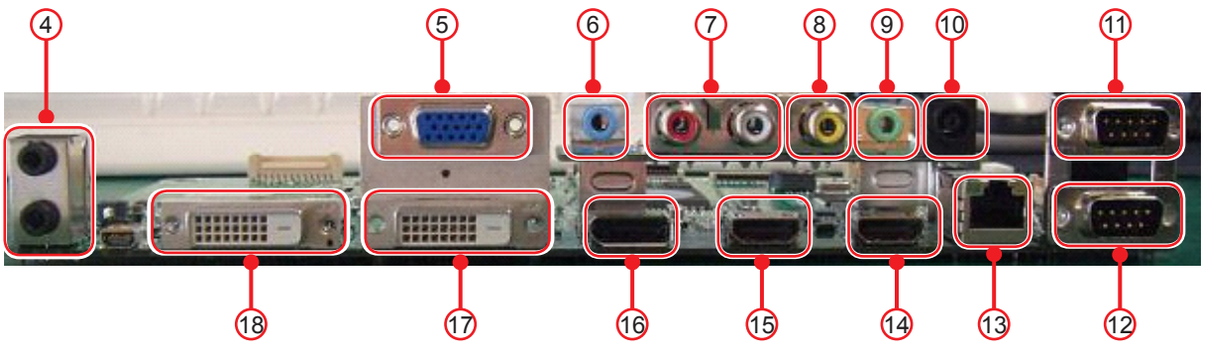

LAN
Keyboard
Mouse
USB Memory
USB HDD
Internet Explorer
210mm
164mm
Coin Battery
Power Connector
DDR3 SODIMM
DDR3 SODIMM
DDR3 128bit
CPU (45x45mm)
SPI ROM
SATA
4 x PCIE
DDR3
MEM to depis
SB (20x20mm)
FDM
Super I/O
Power Block
NB (26x26mm)
16 x PCIE
Clock
HDAudio
Audio Codec
Azalia Jack
Uart
USB
USB
LAN
HDMI
Gbit Eth.
1 x PCIE
TMDS
VGA
FAN
MxM 3.0 Connector
GPU Module (MXM 3.0)
GPU (Mallis-M)
Sub-Power Board
1 + 5V
2 + 5V
3 + 5V
4 + 5V
5 GND
6 GND
7 GND
8 GND
9 + 12V
10 + 12V
11 + 12V
12 GND
13 GND
14 GND
15 ST-BY
16 ON/OFF
1 RX2+
2 GND
3 RX2-
4 RX1+
5 GND
6 RX1-
7 RX0+
8 GND
9 RX0-
10 RXC+
11 GND
12 RXC-
13 TXD
14 RXD
15 SCL
16 SDA
17 NW_DET
18 NW_PW_BT
19 GND
20 GND
21 GND

## 6-2. Board Connection



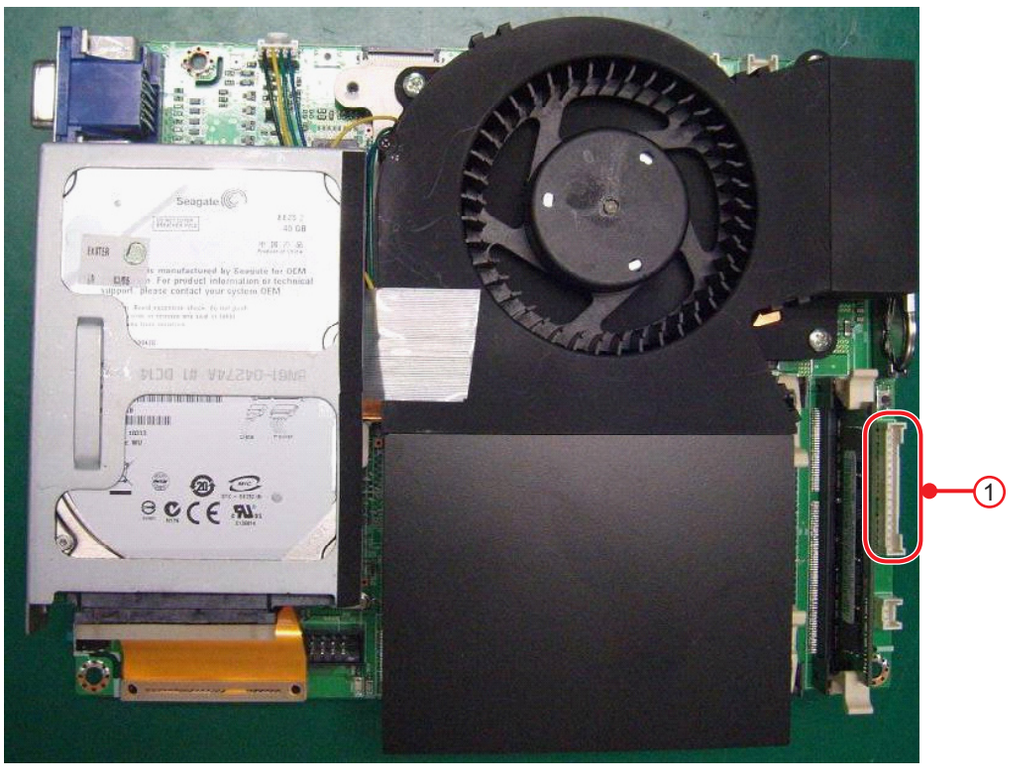
## 6-3. Board Connection (Main Board)

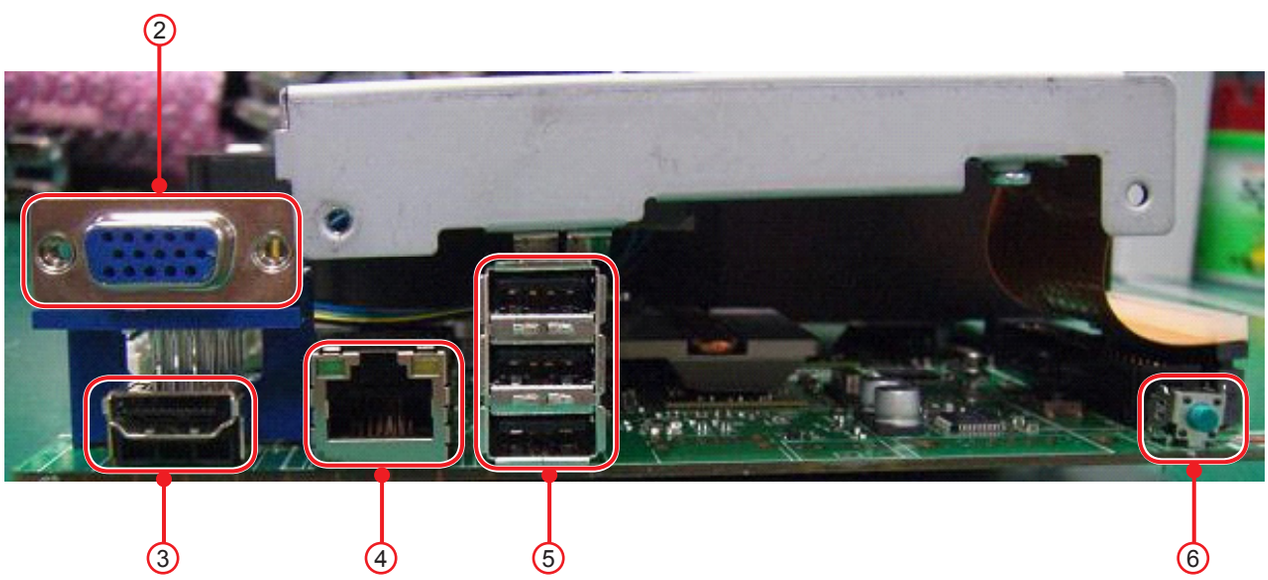



| | | | |
|---|---|---|---|
| ① | Function to Main connector | ⑩ | DC-DC |
| ② | SMPS to MAIN connector | ⑪ | RS232C OUT |
| ③ | FFC connector (31P) | ⑫ | RS232C IN |
| ④ | IR Loop out IN/OUT | ⑬ | LAN |
| ⑤ | D-SUB IN | ⑭ | HDMI2(connected to network) |
| ⑥ | AUDIO IN | ⑮ | HDMI1 |
| ⑦ | AV AUDIO IN | ⑯ | DP |
| ⑧ | COMPOSITE | ⑰ | DVI IN |
| ⑨ | AUDIO OUT | ⑱ | DVI OUT (Digital Loop out) |

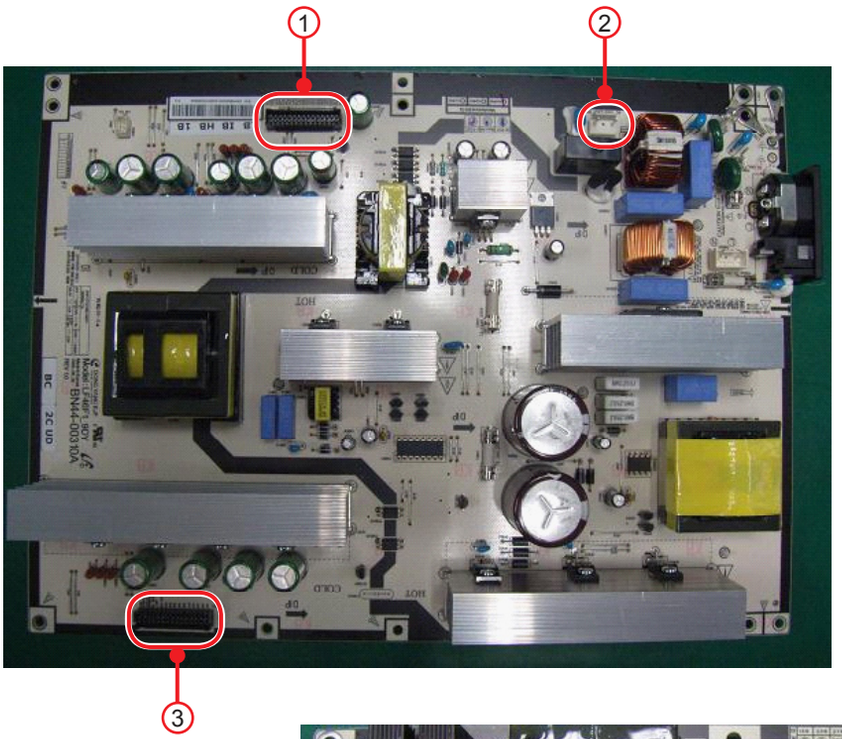
## 6-4. Board Connection (Network Board)



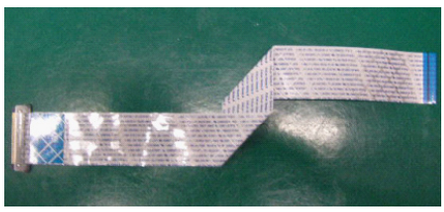

| | |
|---|---|
| 1 | 16Pin power Connector : Network to Sub SMPS |
| 2 | RGB OUT |
| 3 | HDMI out (magicinfo) |
| 3 | LAN Connector |
| 3 | USB Connector |
| 4 | Bios Clear Button : PC bios Reset |

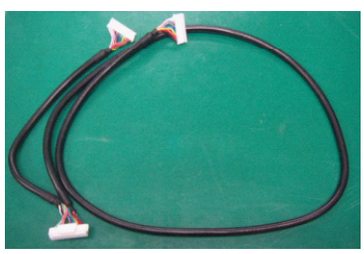
## 6-5. Board Connection (SMPS Board)



| | |
|---|---|
| ① | 30Pin connector : SMPS to MAIN PBA |
| ② | 2 Pin Connector : Sub SMPS to Network PBA |
| ③ | 30pin to 14/14 Pin Connector : PANEL Inverter |
| ④ | 16 Pin Harness : Sub SMPS to Network PBA |

# 6-6. Functions of Cables and Connectors

| Use | LVDS Cable | FAN Cable |
|---|---|---|
| Photo |  | |
| Code | BN96-12453E | BN39-00950A |
| Role | Sends LVDS signals from the video board to the panel. | Sends fan power and signals from the fan to the video board. |

| Use | Inverter Cable | Lead Connector (Only Network Model) |
|---|---|---|
| Photo |  | |
| Code | BN39-01193C | BN39-00984L |
| Role | Supplies power from the SMPS to the panel inverter. | Supplies power from the sub-SMPS to the network board. |

| Use | Lead Connector | AC Cable (Only Network Model) |
|---|---|---|
| Photo | | |
| Code | BN39-01065A | BN39-00618R |
| Role | Sends signals from the main SMPS to the video board. | Supplies power from the main SMPS to the sub-SMPS. |

| Use | LVDS Cable | FAN Cable |
|---|---|---|
| Photo | | |
| Code | BN96-14677A | BN39-01352A |
| Role | Function key (connected to the main video board) | A lead connector contained in the function ass'y. |

| Use | CBF SIGNAL-HDMI | |
|---|---|---|
| Photo | | |
| Code | BN39-01359A | |
| Role | A cable that connects signals between the Magic Info network and main board | |